Volume XX.
Number 5.

MAY, 1901.

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TEXTILE WORLD.

and Industrial Record.

Special Cotton Number

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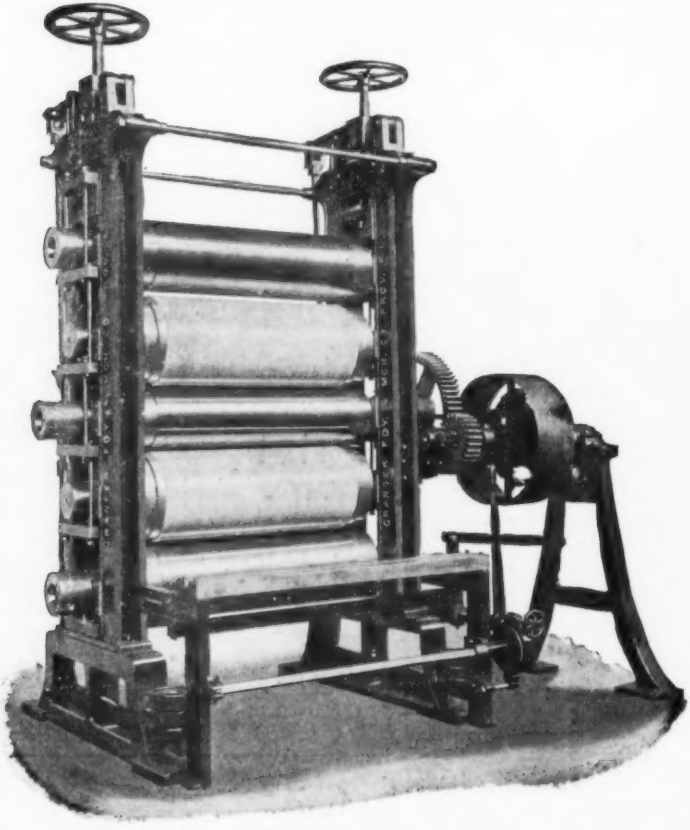
GUILD & LORD.
PUBLISHERS.

620 ATLANTIC AVENUE.
BOSTON, MASS.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDERS, MANGLES AND ROLLS.

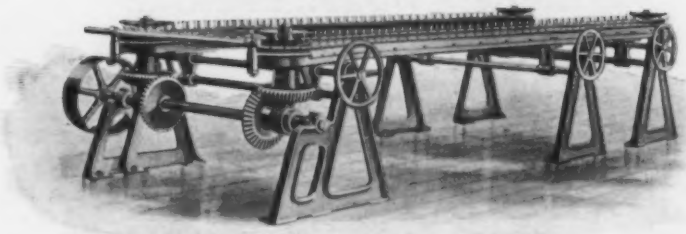
TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

Bleaching, Printing, Dyeing and Finishing Machinery

For Textile Fabrics.



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RETURN (8, 10 or 12) returns FOR WORSTED AND WOOLEN GOODS.

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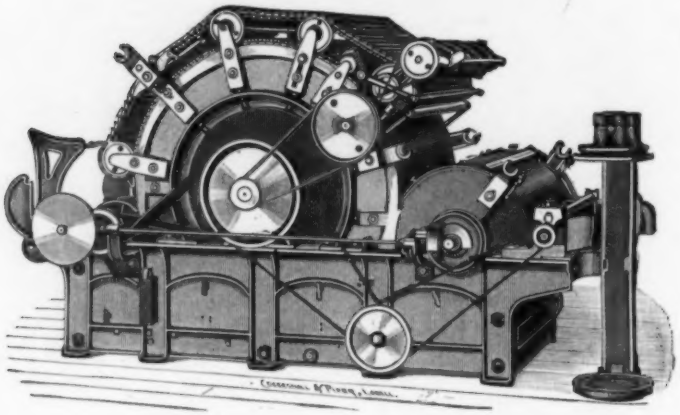
LOWELL, MASS.,

Builders of

COTTON MACHINERY

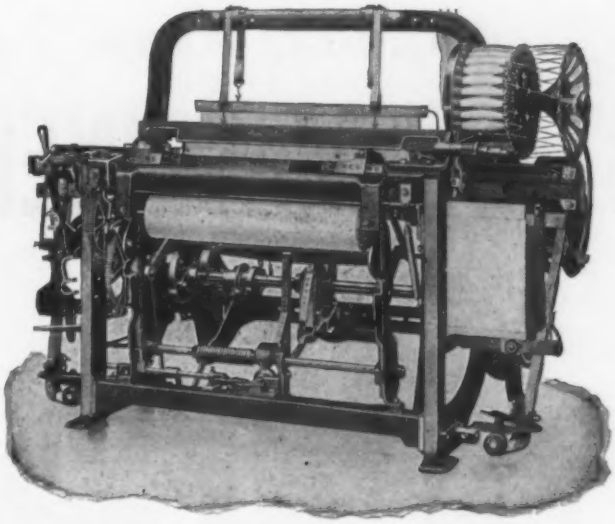
OF EVERY DESCRIPTION.



Revolving Flat Cards, Railway Heads,
Ring Spinning Frames, Fly Frames,
Drawing Frames, Spoolers, Warpers,
Slashers, Looms.

Worsted Machinery.

ILLUSTRATED CATALOGUES SENT ON APPLICATION.



OUR LATEST

NORTHROP LOOM

Although our order list lengthens and strengthens, we do not adopt the simple and inexpensive plan of building without change, but continually add improvements whenever possible. A careful study of the above illustration will prove of interest to adepts in the Art of Weaving.

THE DRAPER COMPANY,

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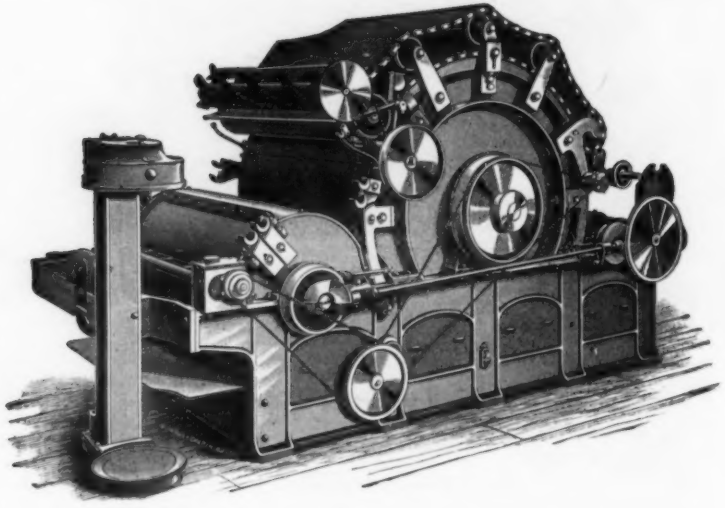
MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY



Cards, Combers, Lappers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING THE

Mason-Northrop Loom.

SOUTHERN AGENCY:

D. A. TOMPKINS CO., Charlotte, N. C.

HOWARD & BULLOUGH

AMERICAN MACHINE COMPANY,

LIMITED.

COTTON MACHINERY.

Pawtucket, R.I.

Boston Office, 281 Congress Street.

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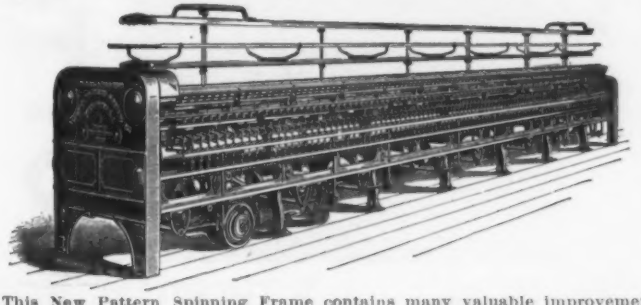
FEEDERS
SELF-FEEDING OPENERS
BREAKER LAPPERS
INTERMEDIATE and FINISHER LAPPERS
REVOLVING FLAT CARDS
DRAWING FRAMES With Mechanical or Electric Stop-Motion.
SLUBBING FRAMES
INTERMEDIATE FRAMES
ROVING FRAMES

Improved New Pattern Spinning Frames.



This New Pattern Spinning Frame contains many valuable improvements which will certainly interest you and pay you to investigate. All parts are specially designed and so constructed as to obtain the highest speed and greatest production.

We Invite Investigation and Comparison.

THE WHITIN MACHINE WORKS,

Whitinsville, Mass.

Revolving Flat Carding Engines.

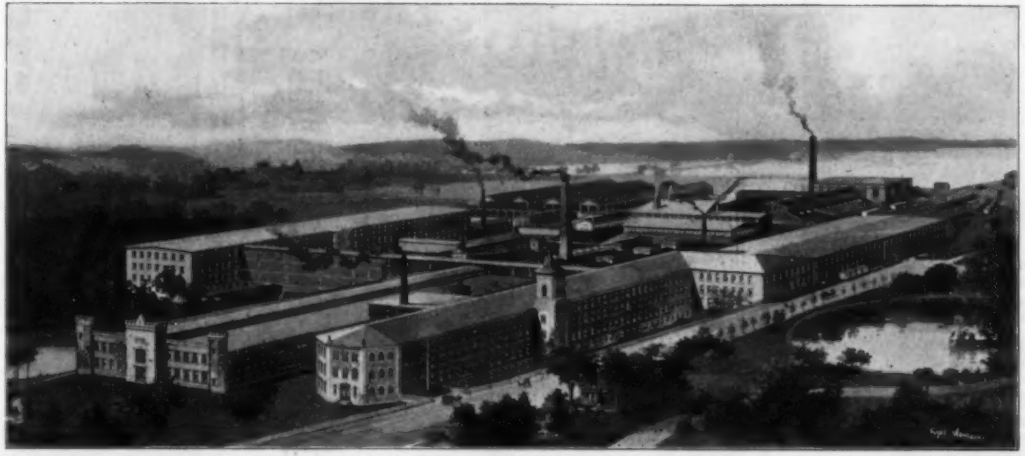
Sliver Lap Machines.

Ribbon Lap Machines.

Combers.

Railway Heads.

Drawing Frames.



Spinning Frames.

Spoolers.

Twisters.

Reels.

Long Chain Quilling Machines.

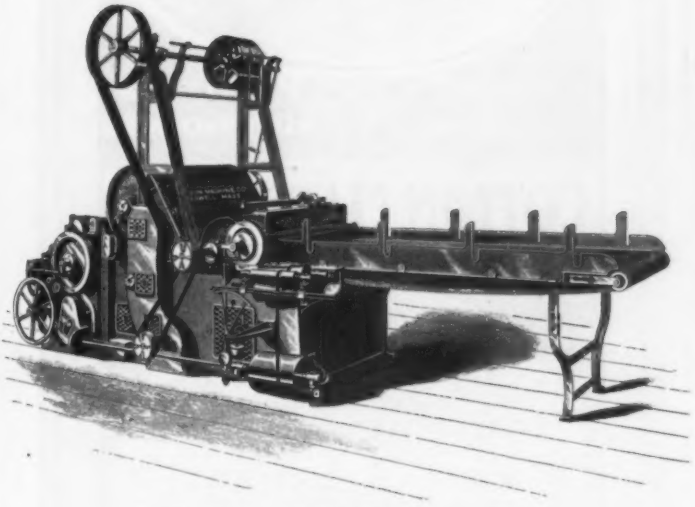
Looms.

COTTON MACHINERY

Southern Agent, S. W. CRAMER, 38 So. Tryon St., Charlotte, N. C.

The Best Pickers.

In the Cotton Field nothing equals the
DARKY COTTON PICKER.



In the Cotton Mill nothing equals the
KITSON COTTON PICKERS.

KITSON MACHINE CO., Lowell, Mass.

Largest Builders of Cotton Openers and Lappers in the World.

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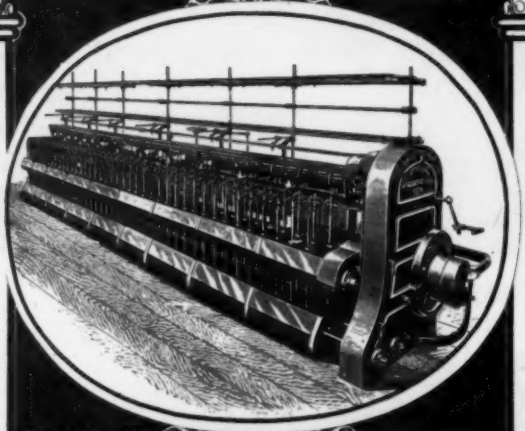
· CARDS · · MULES ·



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CARD CLOTHING · WASTE MACHINERY

COTTON MACHINERY

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Card Room Machinery.
TAYLOR LANG & CO. LTD.,
Self Acting Mules.
WILLIAM RYDER,
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C. CAIN, SON, & GREENWOOD,
Card Clothing of all Kinds
MONFORT'S COMBER.
Cotton Combers for
Short Staples

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Manchester: England,

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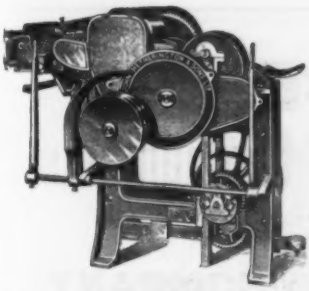
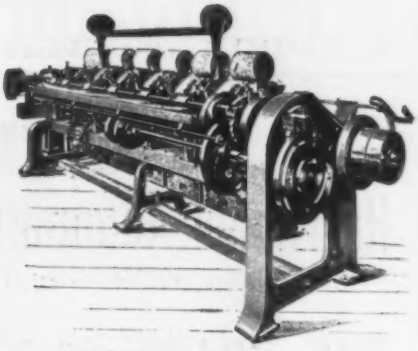
Machinery for Preparing, Spinning, Doubling Cottons, Cotton Waste, Woolen, Etc.

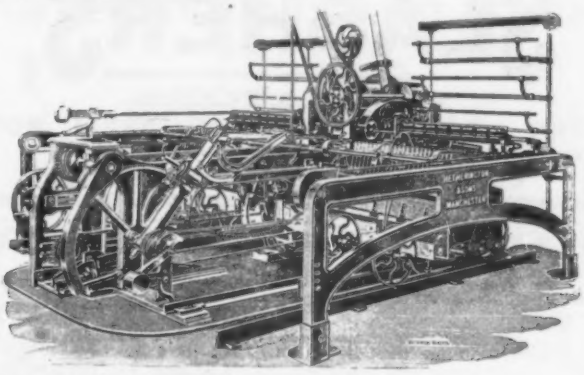




Sliver Lap Machines
with Self Acting Stop Motion.

Ribbon Lap Machines
with six Laps behind for preparing Laps for Combing Machines, made to suit any width of Laps required.

Combing Machines,
single and double Nip for six or eight heads, to take Laps from 7 1-2 in. to 10 1-2 in. wide. Patent Stop Motions for stopping Machine, when delivering too light Slivers, or after any required length has been delivered.



Patent Self Acting Mules (Hetherington and Curtis Patterns of Headstock) for coarse, medium and fine yarns.

Over Three Million Spindles at Work in the U. S.

SOLE IMPORTER FOR UNITED STATES AND CANADA.

STEPHEN C. LOWE, 41-42 BREWER BUILDING, 186 DEVONSHIRE ST. **Boston, Mass.**

"Nothing is either great or small except by comparison."

This accounts for the GREATNESS of the Picking Machinery built by

THE A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

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BUILDERS OF

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TAPER COP TUBES FOR MULE SPINDLES

PAPER SHELLS FOR UNIVERSAL AND OTHER WINDERS

UP-TO-DATE FACILITIES. ORDERS FILLED PROMPTLY.

KILBURN, LINCOLN & CO.,

FALL RIVER, MASS.

MAKERS OF

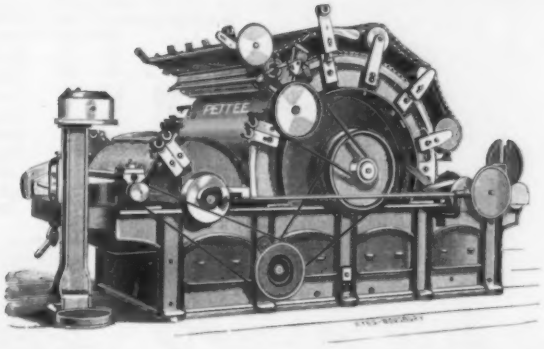
Looms for Plain and Fancy Weaving.

Represented in the South by SEXTON & ROBBINS CO., CHARLOTTE, N. C.

Saco and Pettee Machine Shops,

Newton Upper Falls, Mass., U. S. A.

COTTON MACHINERY



PICKERS, SLUBBING,

REVOLVING FLAT CARDS,

INTERMEDIATE AND ROVING FRAMES,

RAILWAY HEADS,

DRAWING FRAMES,

SPINNING FRAMES, SPOOLERS.

SHOPS:

Biddeford, Maine.

Newton Upper Falls, Mass.

Southern Agent: A. H. WASHBURN, Charlotte, N. C.

THE FISHER CARD FEED

for WOOL, SHODDY, and COTTON, is

Second to None

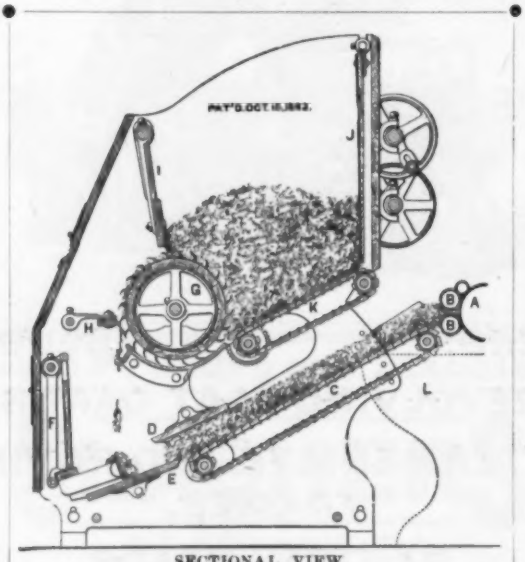
on the market. It holds more stock, requires less space, and needs no "attachments."

WOONSOCKET WORSTED MILLS,
Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
Boston Office, 570 Atlantic Avenue.

WOONSOCKET, R. I., March 4, 1896.

Messrs. Woonsocket Machine and Press Co., City,

GENTLEMEN—In answer to your inquiry of to day as to how we like the FISHER FEEDS would say that, after running one for three months and having put in four more since, is sufficient evidence that we consider the Fisher Feeds the best in the market to-day, and you are at liberty to bring any interested person into our mill to see them running and judge for themselves. Yours truly, WOONSOCKET WORSTED MILLS,
EDWIN FARNELL, Agent.



SECTIONAL VIEW.

THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.

It is built in all sizes and guaranteed as represented.

STAR WORSTED COMPANY,
Worsted Yarns.
C. T. Crocker, Pres. C. B. Smith, Treas.

FITCHBURG, MASS., March 4, 1896.

Woonsocket Machine and Press Co.,

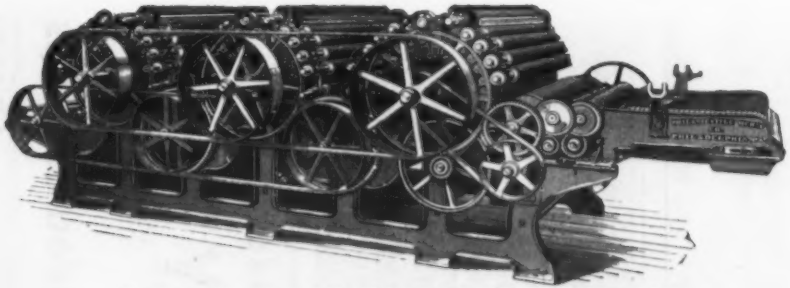
GENTLEMEN—We have the pleasure to inform you that the two FISHER CARD FEEDS are working to our entire satisfaction, giving good results on both long and short wools.

Yours respectfully, STAR WORSTED COMPANY,
(Second order.) A. GARTH, Supt.

MANUFACTURED BY

Woonsocket Machine and Press Co.,

WOONSOCKET, R. I.



Proctor Improved Double Fancy Garnett Machine.

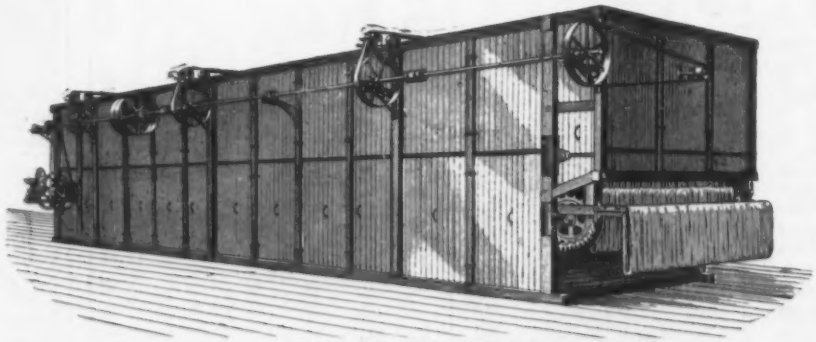
PROCTOR
GARNETT MACHINES

BREASTS, BURRING MACHINES, FEED ROLLS, LICKERS-IN

"CYCLONE" DRYERS

For Hosiery, Underwear, Yarn, Cotton Stock and Wool.

Carbonizing Machines.
Yarn Scourers.



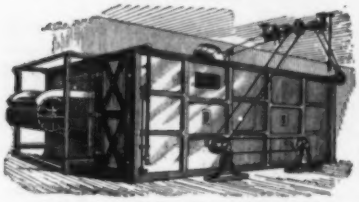
Automatic Yarn Dryer.

PHILADELPHIA TEXTILE MACHINERY CO., Hancock & Somerset Sts., Phila., Pa.

"HURRICANE" DRYERS

—FOR—

WOOL, COTTON, HAIR YARN, STOCKINGS, UNDERWEAR, &c.



Automatic Stock Dryer for Cotton and Wool.

CARBONIZERS,

Yarn Scouring Machines.

"HURRICANE" FANS

for Ventilating and Drying.

Best in Construction. Lowest in Price

Plans, Estimates and Catalogues sent upon application.

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For Fabric and Hosiery Printing.

We Design and make Printing Blocks in type metal, wood, copper, steel, or any material.

We manufacture our own rock maple Rollers and Blocks, and carry a large and well seasoned stock on hand.

Our Calico Stamps are executed by Manchester experts.

This is the largest establishment of its kind in the United States. Estimates cheerfully given. Orders filled rapidly.

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THE LATEST AND BEST.

LOOMS, DOBBIES, HARNESS MOTIONS

BEAMING SPOOLING WINDING DYEING AND SIZING MACHINERY

POWER TRANSMITTING MACHINERY.

FREIGHT ELEVATORS. PATENT FRICTION CLUTCHES.

"ALL SHEAVES LOOK ALIKE TO ME."

DO THEY?

JUST ASK US ABOUT OUR

Machine-Moulded Sheaves.

LINK-BELT MACHINERY CO., - Chicago.

The . . .

Barber

Knotter

Improves the Spooling

Decreases the Cost .. ..

IF you are not using it and do not know about it, drop us a line and our agent will call.

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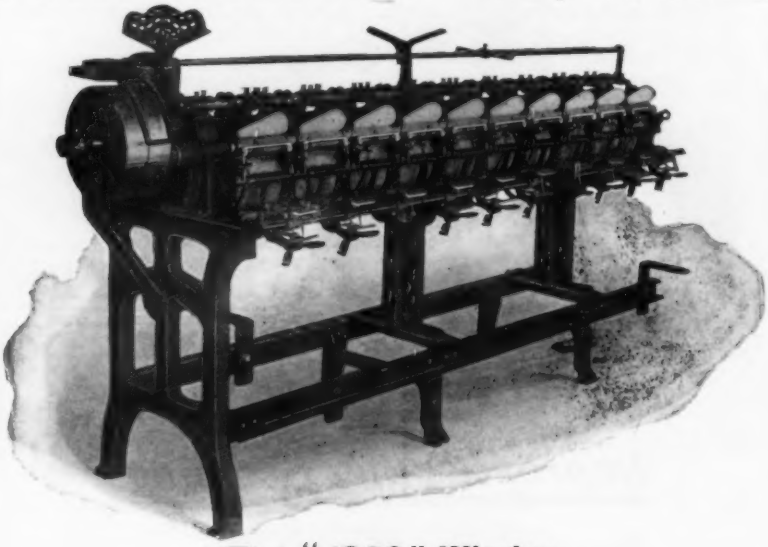
Room 1119

Boston, Mass.

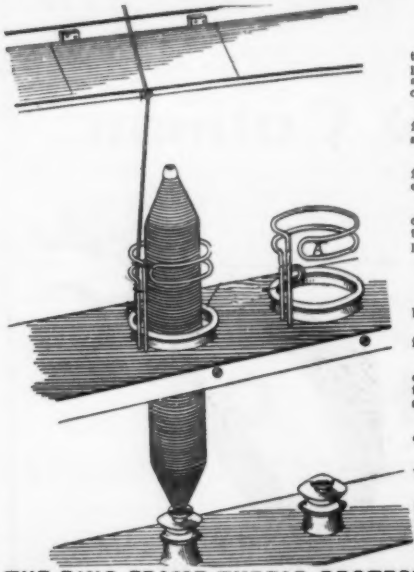
Foster Machine Co., WESTFIELD, MASS.



The "1900" Winder

Patented in United States and Europe. Fastest running Winder in the market. Greatest production, best shaped cones. **NO OIL OR DIRT CAN GET ON THE YARN.** Has independent drive for rolls. Even tension and speed. Less power to run. Stop Motion acts when a thread breaks or runs out.

New Thread Protector for Ring Spinning



The following advantages are claimed for this protector.

1. The speed of the frame will be increased, and also the production on frames without any protectors or plain separators about twenty five to thirty per centum, and on frames with separators about twelve or fifteen per centum.

2. The threshing and consequent imperfection and inferiority of yarn and cloth, occasioned by the use of blade separators is entirely obviated.

3. The traverse of the rail can be increased from one-fourth of an inch to one inch, if frame permits, thereby enabling the use of longer bobbins.

4. The life of the traveller is prolonged fully fifty per cent on account of a more even tension being imparted to the traveller, the same being held in a perpendicular position at all points of the traverse.

5. Frame and rail more perfectly balanced.

6. Heavier travelers can be used.

7. The yarn is wound tighter and more uniformly on bobbins.

8. A material saving in time of doffing, as more yarn is wound on, and longer bobbins can be used.

9. Saving of time of the operator on account of fewer ends breaking, thereby increasing the quality of yarn, and the operator can attend many more spindles in consequence.

10. The life of the ring will be prolonged on account of decreased friction.

11. No accumulation of lint, dust and dirt, which invariably results in the use of blade separators.

The above results have been obtained in the mills of S Sanford & Sons, Carpet Manufacturers, Amsterdam, N.Y. in whose mills the protectors have been in use on all spinning frames since October 1899, and by permission we refer to said firm for a confirmation of our claims.

THE RING FRAME THREAD PROTECTOR CO., - Amsterdam, N. Y.

THE DODGE MFG. CO.

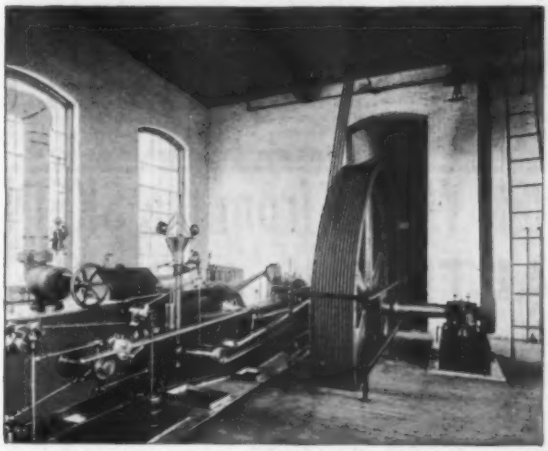
Engineers, Founders, Machinists,

MISHAWAKA, IND., U.S.A.

Branches:
BOSTON. NEW YORK. CHICAGO. CINCINNATI. ATLANTA, GA. LONDON, ENG.

DESIGNERS AND BUILDERS OF

Modern Textile Mill Equipments.



325 H. P. Rope Drive, Gwinnett Cotton Mills, Lawrenceville, Ga.

Embracing
LATEST IMPROVED DEVICES

Embodying
HIGHEST EFFICIENCY
In Power Transmission Engineering.

The "DODGE" AMERICAN SYSTEM ROPE TRANSMISSION.

CAPILLARY SELF-OILING BEARINGS—Oil Economizers.
IRON CENTER WOOD RIM TEXTILE PULLEYS—Designed especially for Textile Mill Work.
COUPLINGS—in variety.
SAFETY IRON CENTER WOOD RIM FLY WHEELS. IRON SPLIT AND SOLID PULLEYS, SHAFTING, ETC.

We have a large engineering force and will be pleased to assist you in the determining of your requirements in our line upon receipt of letter stating just what you desire to accomplish. Address nearest office.

Every Mill Man
Should Keep Posted by Reading
Power and Transmission
a unique publication in trade literature exclusively devoted to MODERN POWER TRANSMISSION ENGINEERING
Copiously illustrated with typical installations. Other articles of interest to the up to date factory are also contained in each issue. Sample copy free by applying to
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BRANCHES ~ BOSTON NEW YORK CHICAGO CINCINNATI ATLANTA LONDON, ENG.

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Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.
PROVIDENCE, R. I.

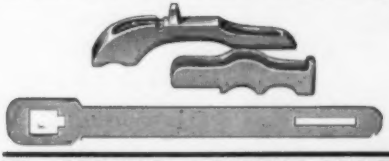
in Mill Supplies.

E. Dixon. Established 1876. F. M. Dixon.

DIXON LUBRICATING SADDLE CO., BRISTOL, R. I.

Sole Manufacturers of

Dixon's Patent Locking Saddles and Stirrups



The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

The Stirrup is always in place.

No bent stirrup resting on rolls.

Manufacturers of all kinds of **Saddles, Stirrups and Levers.** Send for Samples and Prices.

Spinners' Supplies in general.

To WIND LINEN YARNS from the SKEIN

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W. W. ALTEMUS & SON,

2824 North 4th Street, - - - PHILADELPHIA, PA.

FELTON'S CYLINDER COMBER BRUSHES,

Made with

Patent Fibre Bristle

The Patent Fibre Brush is a very satisfactory brush, but the one with Bristle Stock is the longest wearing and best.

S. A. FELTON & SON CO., Manchester, N. H.

EVAN ARTHUR LEIGH,

Successor to E. A. Leigh & Company,

35 & 36 MASON BUILDING - - BOSTON, MASS.

Sole Agent in the United States and Canada for PLATT BROTHERS & COMPANY, Ltd., by far the largest makers in the world of

Cotton, Woolen and Worsted Machinery

For All Classes of Work.

MATHER & PLATT'S Dyeing and Finishing Machinery.
JOSEPH SYKES BROS.' Card Clothing for Cotton.
CRITCHLEY'S Card Clothing for Woolen and Worsted.
LOOMS of all descriptions, etc

WATSON'S HEDDLE FRAMES. WIRE HEDDLES. TEMPERED STEEL WIRE STRIPPER CARDS.

ADDRESS L.S. WATSON MFG. CO., LEICESTER, MASS.. FOR THE VERY BEST MADE

MORLEY RING

SPINNING

TWISTING

TRAVELERS

MORLEY BUTTON M'F'G CO.,

68 Essex Street,

BOSTON, MASS.

BIRCH BROS.,

Somerville, Mass.

Mill Sewing Machines.

Sews any fabric, wet or dry, thin or thick fine stitch or coarse stitch.

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Bleaching, Dyeing and Finishing Machinery.

ESTABLISHED, 1873.

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Our Patented Specialties.

Double Ribbed Rings, U. S. Standard Traveler Cleaners, Metallic Burnish like that produced by The Traveler.

WHITINSVILLE, MASS. U.S.A.

NATIONAL RING TRAVELER CO.

—MAKERS OF STANDARD—

SPINNING AND TWISTING TRAVELERS

OF EVERY DESCRIPTION.

PROVIDENCE, - - R. I.

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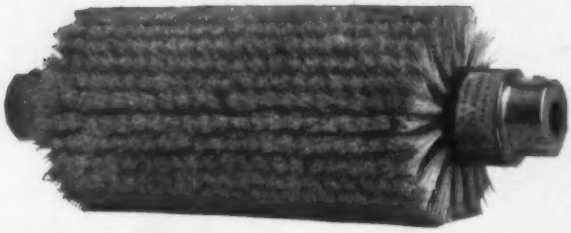

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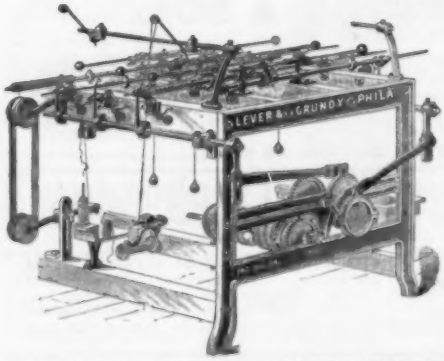

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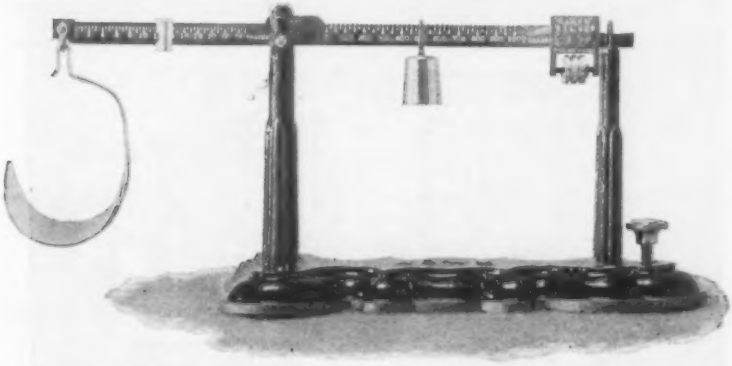

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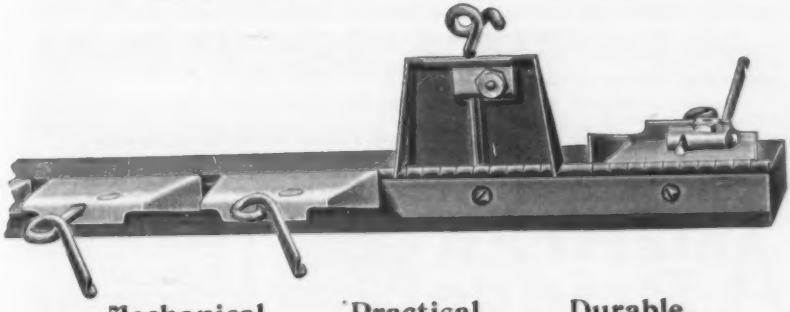

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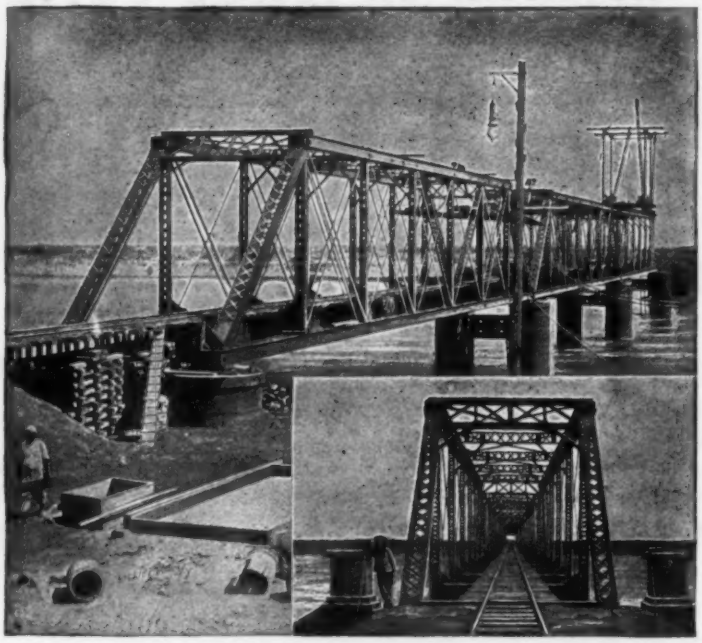

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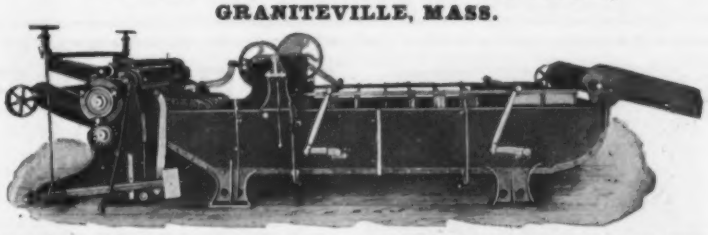

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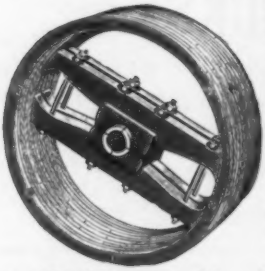

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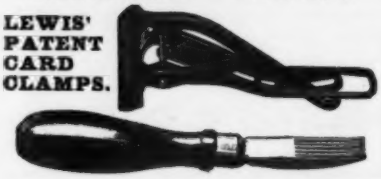

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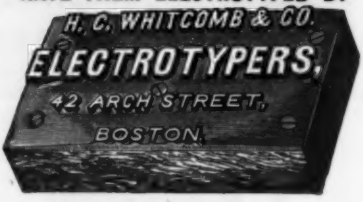

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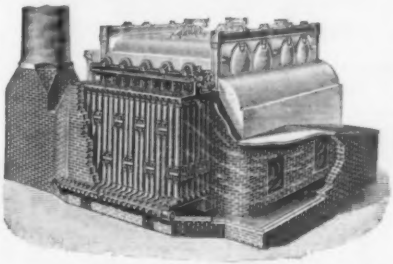

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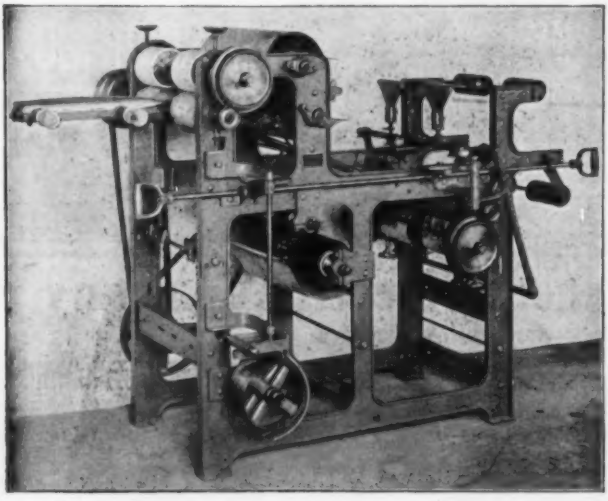

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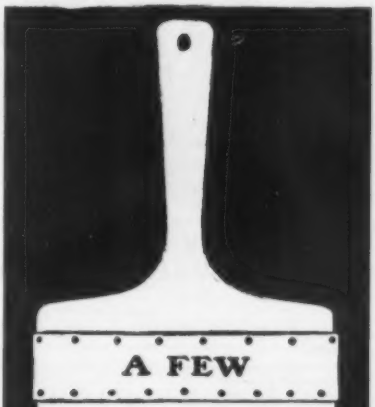

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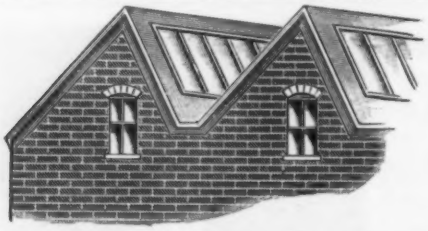

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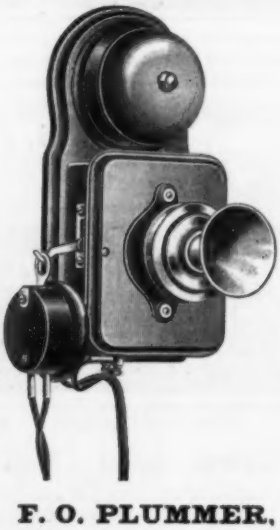

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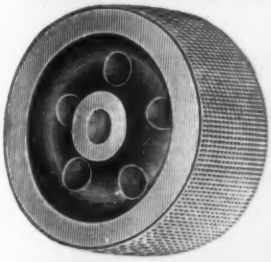

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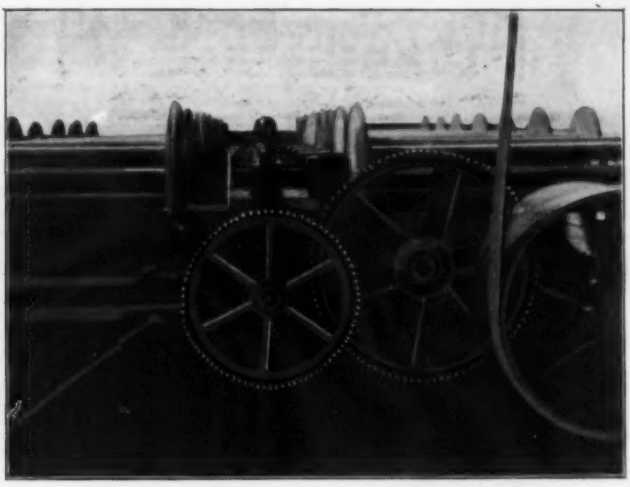

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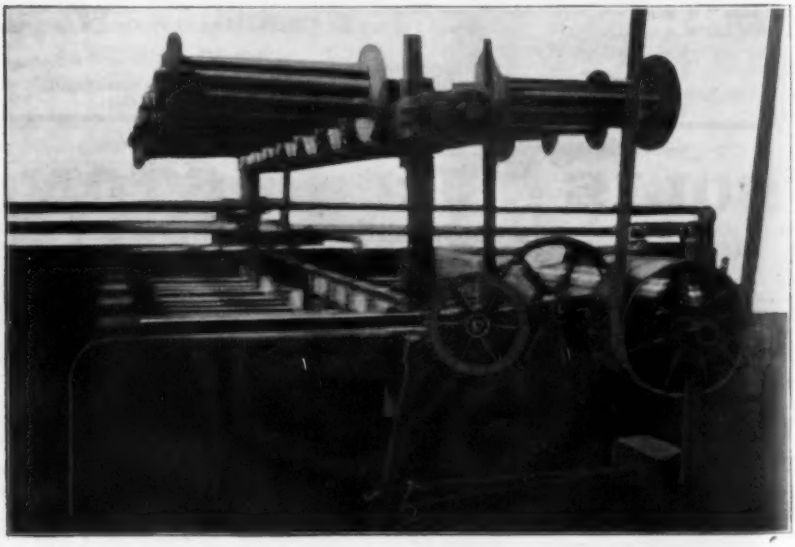

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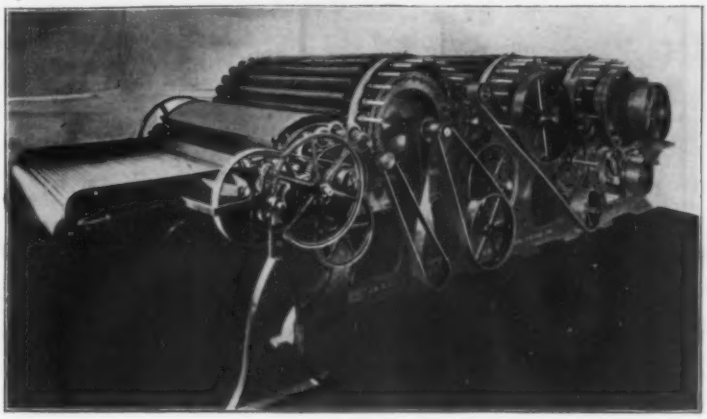

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List of Textile Patents.

Issued April 5, 12, 19 and 26, 1901.

Bobbin-Holder. 671,744. John E. Bacon, Clinton, Conn.

Combing-Machine Dabbing-Brush Mechanism. 672,786. William E. Layland, and John H. Whitehead, Leeds, England.

Combing-Machine Attachment, Cotton. 672,578. Harry Tunstall, Westerly, R. I.

Carding-Engines, Apparatus for Stripping Revolving Flats of. 672,674. Joseph Jones and William Heaps, Ashton-under-Lyne, England.

Dyeing, etc., Apparatus for. 672,645. William Mather, Manchester, England.

Dyeing-Machine. 671,799. Joseph Hussong, Camden, N. J.

Flax-Working Machine. 671,034. Louis H. Schneider, New York, N. Y.

Fabric, Making Mixed. 671,959. Ludwig Kick, Passaic, N. J.

Knitting-Machine. 672,182. Adolph Sedmihradsky, Milwaukee, Wis., assignor to Kalamazoo Knitting Company, same place.

Knitting-Machine. 671,995. Emil J. Franck, Collingdale, Pa.

Knit Undergarment, Lady's. 672,028. Robert M. Appleton, Boston, Mass.

Knitting-Machines, Let-off and Controlling Means for. 671,848. Frank Wilcomb, Norristown, Pa.

Loom Warp Stop-Motion. 671,203. William H. Baker, Bridgeport, Conn., and Frederic E. Kip, Montclair, N. J., assignors to the Kip-Armstrong Company of New York.

Loom for Weaving Pile Fabrics. 672,393. James Buckler, Philadelphia, Pa.

Loom Weft-Replenishing Mechanism. 671,202. William H. Baker, Central Falls, R. I., and Frederic E. Kip, Montclair, N. J.

Loom Warp-Rest. 671,534. Eugene E. Bartlett, Valleyfield, Canada, assignor to Draper Company, Portland, Me.

Loom-Shuttle. 671,820. William Fischer, Jr., Paterson, N. J., assignor of one-eighth to Frank Fischer, same place.

Loom, Gauze. 671,148. Thomas A. Robinson, Paterson, N. J.

Loom Filling-Supplying Mechanism. 672,801. James H. Northrop, Tustin, Cal., assignor to Draper Company, Portland, Me., and Hopedale, Mass.

Loom-Shuttle-Easing Device. 671,807. Harry Rycroft, Bradford, England.

Loom-Shuttle. 671,633. Eppa H. Ryon, Waltham, Mass.

Loom Narrow-Ware. 671,624. Emil Haast, Paterson, N. J.

Loom. 671,667. William F. Draper, Hopedale, Mass., assignor to Draper Company, same place, and Portland, Me.

Loom for Weaving Gauze Fabrics. 670,981. Adolph Brauch and Frank Wellen, Paterson, N. J., assignors to the Enterprise Silk Company, same place.

Loom Warp Stop-Motion. 671,540. William F. Draper, Hopedale, Mass., assignor to Draper Company, same place, and Portland, Me.

Loom Warp Stop-Motion. 671,666. Clare H. Draper, Hopedale, Mass., assignor to Draper Company, Portland, Me.

Loom Filling-Changing Mechanism. 672,169. Oscar Janelle, Manchester, N. H., assignor to Draper Company, Portland, Me., and Hopedale, Mass.

Looms, Automatic Stop and Releasing Device for. 672,385. Benjamin F. Meyer, Camden, N. J., assignor to M. A. Furbush & Son Machine Company, same place.

Loom-Shuttle. 671,720. Sumner A. Dudley, Taunton, Mass.

Mordanting. 671,894. Victor Lendecke, Ludwigshafen, Germany, assignor to the Badische Anilin & Soda Fabrik, same place.

Mordanting Cotton. 671,560. Edward Marx, Dresden-Planen, Germany.

Mercerizing Apparatus. 671,867. Edwin J. Nelson, Middleville, N. Y.

Napping-Machine. 671,457. Joseph H. Stone, North Andover, Mass., assignor to American Napping Machine Company, Williamstown, Mass.

Spinning-Machine. 672,443. Adolph Haenichen, Paterson, N. J.

Spinning-Spindle. 671,694. William H. Goldsmith and Stephen M. Hamblin, Central Falls, R. I.

Shuttle. 671,632. Eppa H. Ryon, Waltham, Mass.

Spinning and Doubling Machine. 671,101. Jacob H. Bek, Stockach, Germany.

Yarn and Fabrics from Silk Waste, Manufacturing. 672,065. Daniel E. Coe, Darby, Pa.

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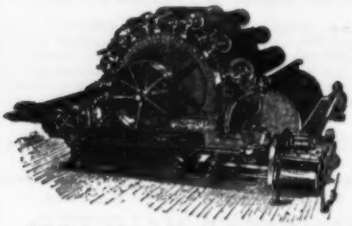

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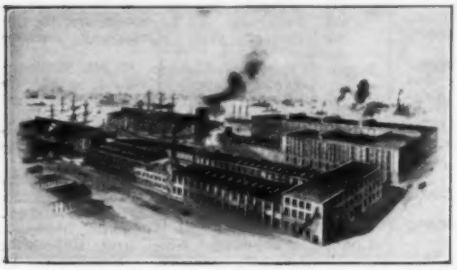

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ANDREW F. GAULT.

TEXTILE WORLD.

Vol. XX. MAY, 1901. No. 5.

ANDREW FREDERICK GAULT.

The subject of this sketch was born in 1833. His father, Leslie Gault, was a successful merchant and ship-owner in Strabane, Ireland. Upon the death of his father in 1845 the family came to Montreal. After a course in the Montreal High School, Andrew entered the service of a large jobbing house. He showed at once his aptitude for mercantile life, and by close observance and application to his duties fitted himself for the higher responsibilities of later years.

In 1853, when but twenty years of age, he struck out for himself, and established the wholesale dry goods business of which he is now the head. This firm now has branches in Manchester, Eng., Winnipeg and Vancouver, doing more business than any other single dry goods firm in Canada. Of all the dry goods houses, which were in business in Montreal when Mr. Gault commenced business in 1853, only three now remain.

Associated with Mr. Gault was the late J. B. Stevenson, the firm name being Gault, Stevenson & Co. On the retirement of Mr. Stevenson, Mr. Gault admitted his brother, the late Robert L. Gault, to partnership, the firm name being changed to Gault Bros. Not long after, another change occurred, Samuel Finley being admitted to the firm, the name being changed to Gault Bros. & Co., by which it was known for forty years.

Ten years ago Robert W. MacDougall and Leslie H. Gault were admitted as partners, and soon after James Rodger entered the firm. In 1896, the firm was incorporated under the name of Gault Bros., Limited.

Mr. Gault has not only made his mark in mercantile life, but has been prominently identified with Canada's manufacturing industries. Previous to his engaging in cotton manufactures, that business was badly cut up, and profits were wiped out by the competition between a number of small manufacturers. Mr. Gault invested in a number of cotton mills, and was instrumental in concentrating Canada's cotton industry in a few concerns, thus avoiding the ruinous competition which previously existed in the business.

He is President of the Dominion Cotton Mills Co., Montreal Cotton Mills Co., and the Trent Valley Woolen Mfg. Co. In addition to these extensive interests in textile manufacturing, he is a member of the Board of the Bank of Montreal, director of the Liverpool, London & Globe Insurance Co., a governor of the Montreal General Hospital, a member of the Montreal Board of Trade, and vice-president of the Diocesan Theological College, House of Industry and Refuge, and Andrew's Home.

His great executive ability enables him to satisfactorily perform the onerous duties connected with these offices, and at the same time manage his extensive business interests. He is a generous man, and noted for his unostentatious charity. He takes a deep interest in church matters, and presented to the Diocesan Theological College, of which he is president, the extensive and well-appointed building on University St., Montreal.

In 1868 Mr. Gault married Miss Louisa Harman, of London, and his family consists of a son and daughter.

THE COTTON MANUFACTURERS' CONVENTION.

The address of President Thompson at the meeting of cotton manufacturers should be carefully read. It makes a fitting close to a successful administration, of the duties, of the office. He spoke of the probability of more frequent recurrence in the future of disturbance and depression in the business of cotton manufacturing. This is not, as it sounds, the cry of a pessimist. It is simply a reading of the plain signs of the times. The rapidly increasing production of our mills has, during the last two decades, been met by an increasing power of consumption, due to the lowering of cost of production, and to the increased wealth and population of the United States, whose markets have been preserved for home manufacturers by high tariffs. The reduction in cost cannot go on indefinitely, and it is plain to even the casual observer, that the productive capacity of the mills is now in excess of consumptive needs.

The Southern mills have been a powerful factor in bringing about this change, both in cost and volume of production. Within but a few years the discovery has been made that the South contains a vast body of workers eager to turn raw cotton into cloth, for less than ⅔ of previous labor cost. The result is seen in the rapid growth of Southern mills, until they now contain upwards of 5,000,000 spindles, and in the flooding of the domestic markets with manufactured goods, until mills both North and South are forced to restrict production.

The causes of the present depression as President Thompson states, are well understood. It is a remedy, however, in which the trade is far more interested. That remedy does not consist in a reduction of wages. It would, according to Mr. Thompson, require a reduction of 20 per cent. in wages at the North, to offset the fall in price of goods. Suppose that equalization was made. How much better off would the market then be, with storehouses still packed to the ceilings with goods that the consumer does not need?

The remedy lies, not in a reduction of wages, but in bringing production and consumption nearer an equality. This can be done only in two ways. Either make less, or, consume more. The first course is the easier, and it is this which President Thompson urges. The theory is all right. The difficulty comes in the application. Manufacturers curtail only when they are forced to it by the logic of events in the form of unsold goods, and falling prices. Even then the hope of a turn for the better delays the shut down, and puts that turn for the better still farther off in the future.

The other remedy for the present trouble, increased outlet for goods, would be equally effective as and more satisfactory than curtailment of product. But how is it to be brought about? The domestic market will not absorb more goods, except at much lower prices, and already prices are below cost of production. The foreign market, on the other hand, is to us an unexplored field, and it is in this direction that President Thompson urges cotton manufacturers to turn their attention. He states, that "We had acquired a foreign trade in cottons amounting to $23,000,000." For 1899 and 1900 our yearly exports of cottons did reach these figures, but it was a very slender hold that we had on this trade. A number of Boxers on the warpath in China has reduced this trade about 40 per cent. since last June, and today we are exporting cottons at the rate of less than $14,000,000 per year. This is about equal to the exports of 1891.

The president of the association urges manufacturers to "combine for the capture of foreign markets," citing the good work already done by our foreign consuls, the Philadelphia Museum, and the National Association of Manufacturers. Undoubtedly, these associations are doing valuable preliminary work in exploiting foreign markets, but the essential requirement to get and hold any market is the abil-

ity to compete in price and quality, and deliver the goods which the consumer wants. With wages in this country on the Southern level, there can be no reason why our manufacturers cannot compete with those of Europe. Then comes the "drumming" of the markets. This is not to be successfully done by consuls, valuable as their services undoubtedly are, but in the way that every market has been captured in the past, by "drummers" sent out by firms who are trying to sell goods not alone for the public good, but in order to make a profit for themselves. The foreign market must be studied, the languages must be learned, foreign tastes and whims must be catered to, and foreign competition must be met. Let no one be deluded by the idea that this foreign trade in cottons is to be secured without taking foreign manufacturers into account. We ask the reader to turn to the reply to a question which appears in this issue entitled, Patents in Foreign Countries. The United States appears with 20 per cent. of the cotton spindles of the world. The other 80 per cent. is scattered among people who work for as low wages as are paid in our Southern mills, and, although they are now somewhat frightened with the spectre of American competition, they are accustomed to fighting for everything they get, and are warned and ready for us.

We must reckon with England's 42 per cent., and with Continental Europe's 30 per cent. of the world's spindles, in our designs on foreign markets. We may win a few rounds, but they will tighten their belts and try again and again. And, after that contest is settled, we may have one of a different kind with the "yellow peril" from China, Japan, and India. They do not cut much of a figure now, but a population of 800,000,000, whose workers are satisfied with anywhere from 3 to 20 cents per day of 12 hours, is calculated to furnish "food for thought." On top of all this comes the settled policy of nearly every country in the world to protect its own market by high tariffs.

We cite these facts, not to discourage efforts to secure a foreign outlet for our goods. Let us do all we can in that direction, while at same time bearing in mind the conditions that we are likely to meet.

In the discussion of the question as to the unification of yarn numbering throughout the world the proposition was advanced by one speaker, that the English standard of 840 yards per lb. for each count be adopted as the universal standard. This idea not only ignores all other branches of textiles, woolen, silk, linen, etc., and the benefit arising from the decimal system, but proceeds on the curious assumption that this question should be decided by weight of numbers, or of spindles, as it were. The decimal system is surely making its way toward universal adoption. Russia has recently taken important steps in this direction. Mr. Sanford called attention to the fact, noted in our April issue, that instruction in the metric system had been made compulsory in the public schools of England; and it is significant, as stated before the Paris Congress, that nearly every board of trade in England had given its approval to the adoption of the decimal system of yarn numbering. All agree it would be a good thing, but each one is waiting for some one else to do something, and the result is nothing is done. It is a case of everybody's business and nobody's business. Nothing is likely to be accomplished except under some form of compulsion, and if Continental Europe can succeed in their attempt to force the rest of the world to abandon the many absurd systems of yarn numbering now in vogue, it is a form of coercion which we should welcome and wish every success.

—Calico print works in Scotland are running very slack, and it is reported that the calico combine propose to shut them down entirely, and concentrate the business in Manchester.

LABOR AT ITS BEST.

About one million dollars per day are paid to the employees in the textile mills of this country. In return for this outlay services are rendered which convert the so-called raw material into a product suited to the wants and necessities of the consumer and with a correspondingly enhanced market value.

The extent to which this value is enhanced is due in great measure to the efficiency of the worker, and that efficiency depends in large measure upon the intelligence and enthusiasm which the worker puts into his task. Every reader of these lines knows how much more he or she is worth if thoroughly in earnest. Earnestness is what makes us worth something; the lack of it makes us worth nothing.

This earnestness is a natural instinct in all. It may be brought out or repressed, and the best methods of arousing it should be studied as carefully by mill managers, as they study the best machinery and processes of manufacture. How can each one of the seven or eight hundred thousand textile operatives in our mills be made thoroughly in earnest?

The subject is too extensive to be considered in detail in this article. We simply desire now to call attention to the importance of the work. Recently we have published articles from workers themselves, touching upon certain phases of the question. We shall doubtless again have occasion to present similar communications. The solution of the problem would materially increase the value of that for which one million dollars per day is now being exchanged in the textile industry.

Notes of the Month.

—As a result of the efforts to secure a change in the tariff on cotton goods imported into Cuba, which would be more favorable for American products President McKinley has announced a modification, as follows:

"Paragraph 114 will read as follows:

" '114. Tissues, plain and without figures, napped or not, weighing ten kilograms or more per 100 square metres, unbleached, bleached or dyed, and

" 'Tissues, plain and without figures, napped or not, measuring not over sixty-five centimetres in width, weighing eight kilograms or more per 100 square metres, unbleached, bleached or dyed, having:

a. Up to 9 threads, N. W., kilog.....$0.13
b. From 10 to 15 threads, N. W., kilog. .17
c. From 16 to 19 threads, N. W., kilog. .23
d. 20 threads or more, N. W., kilog... .35

" '114c. The same tissues, printed or manufactured with dyed yarns: Dutiable as the tissue, with a surtax of thirty per cent., N. W.'

"This order shall take effect and be in force on and after the first day of April, 1901."

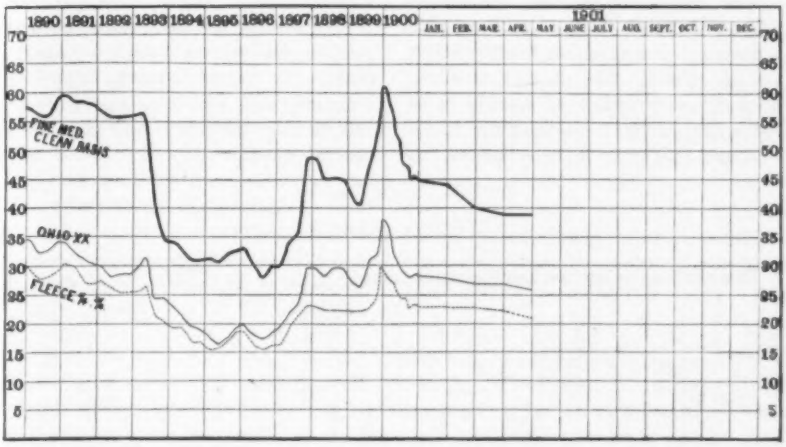
—It is reported that efforts are being made to introduce the cultivation of cotton into Cuba. A quantity of seed has been secured from Egypt, the Sea Island plantations of Georgia, and the Mississippi Valley. Pamphlets printed in Spanish and containing information in reference to the cotton plant and its culture, are being distributed throughout the island. It is stated that cotton was cultivated on an extensive scale in Cuba fifty years ago.

—The average yearly earnings of operatives in five leading industries of Massachusetts, in which are employed 45 per cent. of all the employees engaged in manufacturing in the entire state, are shown in the following table for three separate years:

Classification of Industries.	1895	1898	1899
Boots and shoes, . .	$472.62	$460.10	$469.04
Cotton goods, . . .	340.24	322.99	331.92
Leather, ...	482.80	465.22	470.42
Machines and mach'ry,	538.23	550.54	554.27
Woolen goods, . . .	368.14	370.73	374.92

—A scene representing the coronation of Franz Joseph I, woven in silk and presented to the Austrian Gewerbe-Museum, measured 120 centimetres (47¼ in.) wide and 148 centimetres (58¼ in.) long. The patterns for this design were reproduced from the original by the Szczpanik photographic process. The inventor states that the weaving was done on a loom with 7872 hooks, and required 43,776 cards which weighed 2294 lbs. The work of making the design by the new process is said to have taken six hours.

WOOL MARKET.



Reports from the West indicate that the shearing of a very large clip has been somewhat interrupted by the prolonged storm, but that the new wool is being freely purchased at prices equal if not higher than present quotations in eastern markets.

There is a feeling in the trade that the market has struck bottom, and conservative houses have changed somewhat the cautious tactics followed for so many months, and are showing a disposition to exchange their cash and credit for new wool.

This course has not yet been adopted by the manufacturer, who can see little reason for buying raw material while the clothier shows such an unwillingness to invest in the manufactured product. Occasionally a mill is found that is well supplied with orders, but these are the exceptions, and are generally found to be working on low grades, and apparently giving unusually good value for the money.

Prices have undergone no change. It is very unusual for wool prices to rise at this time of the year. A glance at the chart will show that the year 1897 is the only one in the last eleven, when prices have advanced at this season of the year, and in that year the course of the market was affected by abnormal conditions. The free wool policy was about to be reversed by the new administration. Fine medium territory was selling at 30 cents scoured basis.

For the balance of the decade, we find advances to have occurred, if at all, after the clip had been transferred to the account of eastern houses. Indications now are that 1901 will be no exception to this rule.

The western grower is undoubtedly better equipped than ever before to offer an effective resistance to this policy of transferring the new clip to the eastern dealers at low prices, and turning it over later to the mills at high prices.

The seasons in manufactured goods come at such a time that the manufacturer is between hay and grass when the new clip is coming forward. The heavy weight season is well advanced, while the light weight season is three months away. He is forced to choose between speculation and leaving the staple alone.

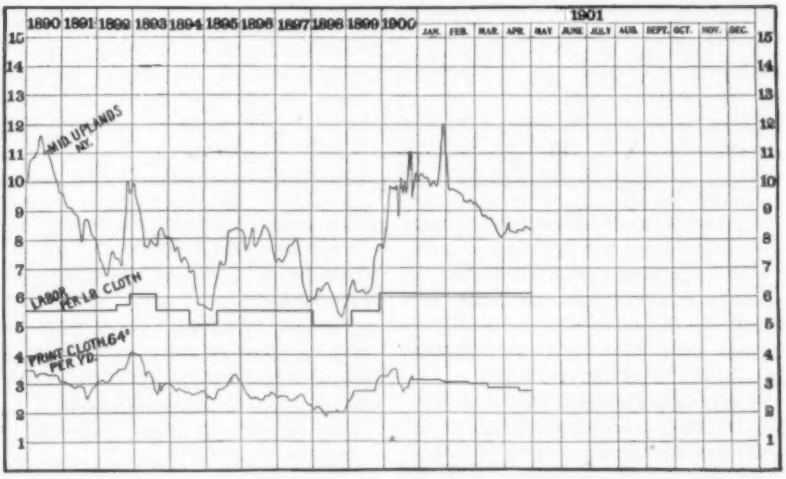
In the former case he is apt to find when the light weight business materializes, that he is loaded up with grades of wool that are unsuited for the fabrics he has sold; while, if he does not buy, he is generally compelled to pay for wool from which to make light weights, prices considerably in

advance of the level on which the prices for goods had been based.

The volume of business transacted during May has been of moderate dimensions. No idea can be formed of its exact size. The figures now advanced as statistics of weekly wool sales are purely a work of the imagination; this cannot be disputed, as the policy adapted by the majority of the dealers of refusing to give statements of sales, is well known.

This refusal has done much good in putting the correct brand on figures that in the nature of things cannot be accurate, and which at one time received more or less credit for being near to the facts.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900
1901
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
MID UPLANDS N.Y.
LABOR PER LB. CLOTH
PRINT CLOTH 64" PER YD.

The conditions of the cotton market during April have been unusually quiet. Speculation has been of extremely moderate dimensions, and the unfavorable outlook in the goods market has discouraged any recovery in prices for the staple. The curtail ment of production among the mills, both at home and abroad, has undoubtedly had a marked effect upon the market for raw material, and there is a very strong belief which, as the weeks pass, grows into a certainty, that there would be an enormous acreage of cotton planted this year, and that fertilizers will be freely used to make the production per acre as large as possible. If the cotton crop of 1901 is not a record breaker, it will not be the fault of the Southern planter.

The uniformity of the line on our chart reflects market conditions, and there is no change of importance to be recorded in the situation. The goods market is still very unsatisfactory, and the need for curtailment for production is as pressing as ever. Print cloths have dropped to 2¾ cents, and yet the low price of goods does not seem to result in any great increase in the volume of business.

The situation abroad is still unsatisfactory. Conditions in China are far from being settled, and the volume of business done with that country shows but litttle increase. The English spinners and traders, viewing the prospective large crop of cotton and the unsatisfactory condition of the goods market both at home and abroad, are counting upon low prices for the raw material, and this sentiment results in restricted dealing. Time alone can tell whether this policy is the wise one or not. The same confidence in the ability to get cotton somewhere existed last year, and yet

many were badly pinched before the new crop arrived. The many contingencies which may arise to upset calculations, renders it advisable to adopt a conservative policy, as regards the future course of cotton prices.

The weather will next month become a factor in the situation. Business in general is good, and no reason can be found upon which to base a belief that the cotton manufacturer is not to enjoy a period of healthy business.

The Chronicle reports the total visible supply on April 26th, to be, 3,800,790 bales as compared with 2,986,952 in 1900, 4,933,708 in 1899, and 4,235,452 bales in 1898.

Foreign Notes.

—An exposition is to be held at Rouen, France, from July to September of this year, under the name of Exposition of Arts for the Decoration of Fabrics. It is to be open to exhibitors from foreign countries as well as from France, and the display is to be divided into four groups, as follows: History of Decoration; Decorated Fabrics in 1901; Fabrics for Export to the Colonies; Processes and Products Employed in Decoration.

—The less expensive cotton goods imported into Nicaragua nearly all come from England. The knit goods imported into Nicaragua are nearly all supplied from Germany.

—A representative of the Cotton Factory Times gives an account of an improvement to the self-acting mule in an Oldham mill. The ordinary slips are dispensed with and the floor cleared of all obstructions, except the steadying bands; this makes it much easier for the passers and winders while attending to their work, as they were able to move about with freedom and without risk of injury by coming in contact with the slips.

—Stagnation prevails in textile manufacturing in Germany. Help is being laid off in large numbers, both in the textile and machine branches. A wage rate of four or five shillings per week is not unusual. It is said that in the Kirchberg cloth district, many families have to support themselves on 10 shillings per week. Recently, the representatives of German weaving firms met in Stuttgart to consider the situation. It was reported that out of 37,000 looms, over 6000 were idle, and that the number of idle looms would be increased.

—Flachs und Leinen reports the European flax and linen market as remaining in a waiting condition. There has been no revival in the demand for goods, consequently the looms are slack and weavers purchase only from hand to mouth. The same depressed conditions exist in the twine trade. On the other hand the extremely small flax crop in Russia, and the very poor quality of the fibre maintains the price of the raw material at a high level.

—United States Consul at Mezreh Mamouret-ul-aziz, Turkey, states that a new silk factory is contemplated in his district, and the interested parties desire to have the silk machinery builders in the United States furnish estimates for the weaving equipment. He states that the motive power is to be furnished by tread mills run by horses.

—Our consul at Tamatave, Madagascar notes as an encouraging indication for the export trade in American cottons, that an importer, M. Delacre at Tamatave, invites correspondence with manufacturers and agents in the United States in regard to certain well known brands of cotton goods. This importer is one of the largest dealers in French cottons in Madagascar, and his inquiry indicates a change from French goods to American. He requests that samples of the goods, with complete details, be sent to him.

NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION.

Annual Meeting, Boston, Mass., April 24, 25, 1901.

The annual meeting of the New England Cotton Manufacturers' Associotion opened April 24th, at 11 A. M., with a short address of greeting by President Thompson; he was followed by Thos. N. Hart, mayor of Boston, who in a few well-chosen words welcomed the members to the city, and offered to make satisfactory arrangements for their entertainment in all respects, except the weather, which seemed to be beyond his control.

Henry S. Pritchett, President of the Massachusetts Institute of Technology, then delivered the opening address, taking for his subject the question, "Is there a place for a profession and commerce?" His address was able, and listened to with close attention. He called attention to the great change that had taken place during the last forty or fifty years, in the view taken of the engineer's part in production; formerly it was considered that the engineer could be educated only in the school of what was called practical experience, and that the time spent in the schools and colleges was of secondary importance. Today, however, it is an admitted fact that no engineer is equipped for his work without a thorough training in the schools to furnish ground work, or frame work for the knowledge subsequently gained in the actual contact with industrial problems. He showed as an illustration of the value of engineer skill the great reduction made in the cost of handling, and transporting coal on the great lakes, which had made it possible to carry a ton of coal a mile with the expenditure of power produced by a piece of coal not much larger than a man's finger.

President Pritchett's argument led to the conclusion, that a like change would take place in the training of men for commerce, and the management of industrial enterprises.

Next came the address by President Thompson, as follows:

PRESIDENT'S ADDRESS.

Gentlemen,—In the performance of my duty I find much pleasure in bidding you all a most cheerful welcome to the seventieth convention of the association.

Since our last meeting we have passed from the nineteenth into the twentieth century. It is a memorable event and suggests a careful consideration of the past as a guide for the future. Your association was founded 35 years ago. While a comparatively brief period, it represents 70 per cent. of the 50 years since 1851, during which time the larger part of the world's marvelous achievements have been wrought. As we review the events and note step by step the inventions and contributions of genius in their practical application to the industrial arts, and further observe the progressive movement in systems and business methods, we are well nigh appalled at the wonderful exhibit. There is sufficient to compel the most serious thought and the desire to know what the future portends. We are well aware that the operations of these marvelous forces have produced our modern civilization and have advanced all of our people into higher planes and more comfortable living. The movement is destined to go steadily onward along the lines of a progressive development which reaches beyond our vision.

Our experience in the past contributes the means of protection in the present and the only guide in preparations for the future. The marvelous achievements of the past inspire

an ambition which is boundless in its aspirations. In the operations of business, conditions are continually changing; they involve questions which compel grave solicitude and justify the most careful conservatism and, again, the opposite, in prompt, bold and aggressive action. The lines drawn in the competitions of trade are sharp and incisive. "It is a survival of the fittest." We can appreciate the solicitude and the anxieties of those charged with the burdens of great responsibilities in banking, commerce, trade and manufacturing. The watchword is "eternal vigilance," the only safeguard and assurance of success.

RESPONSIBILITIES OF THIS ASSOCIATION.

This very brief reference suggests a sphere within which there is illimitable material worthy of careful consideration. There are questions likely to arise in connection with your interest such as you have not undertaken in the past. I have no question that after due reflection your action in the matter will be wise. The objective purpose of the New England Cotton Manufacturers' Association is declared to be the "encouragement of scientific investigation and experiment as to the methods of manufacturing cotton; collecting and imparting information relating to this industry and promoting social intercourse among its members, and to establish and maintain a library of works on textiles in the city of Boston." It is along these lines that the past work of the Association has been done. The results are duly recorded, and constitute enduring testimonials to the wisdom of the founders. The Association has received wide recognition and has become a power of commanding influence. Its achievements have become such as to justify your pride and reflect honor upon all who have in the past contributed their efforts in its service. In the natural order we may expect this work to go forward steadily improving.

In this connection, I wish to suggest the importance of securing a more extended and general participation of members in the work of the Association. It is desirable that more papers shall be presented which treat directly of questions concerning the material machinery, and process of manufacture. This brings into the foreground the active members and managers of the mills. It is a matter of very great interest that members shall more freely engage in the discussion of the papers presented and also the topical questions. In the accomplishment of this object there is nothing of more value than the "promotion of social relations," becoming better acquainted and securing each other's confidence. Apart from the pleasure to be derived, reciprocal interests will develop of substantial value.

I suggest for your consideration the proposition that the time has arrived and the business conditions are such as to justify a broadening of your Association work. Hold fast to that which you have, but extend your operations into wider spheres of action. You are familiar with the steady but remarkable progress of the past. It has touched every department of trade and industrial occupation. Methods and systems have changed. You are entering into a new epoch. You are to meet conditions such as have not heretofore been presented. Your experience and observations have been sufficient to impress upon your minds the necessity of preparation to meet the exigencies of the future.

You are conversant with and appreciate the value of organization. Its functions are of incomparable worth in the attainment of objects of vital interest. Evidence of this abounds in the innumerable associations which have been organized during the past ten years for the purpose of promoting interests not otherwise possible. Your Association is among the oldest. The interest in cotton textiles, which it represents, is one of the most important in the industrial arena of the country. These interests have been developed through conservative man-

agement and a steady growth. The business has been restricted to a domestic trade; the consumers have been our own people. These conditions are changing and we are now in need of an outlet for our surplus products. In this connection we are reminded that "there is a destiny which shapes our ends," and human forces are the instruments which are employed in its achievement. There are questions which confront the financial management of the cotton industry of the United States such as have not heretofore been considered; some of them are of vital import and demand early and serious attention.

I believe this Association can be employed in such manner as to render incalculable service. It can accomplish exceedingly valuable work in the matter of information and kindred material relative to foreign markets for an export trade. Very much of this is being done through United States consuls, and notably by the Philadelphia Commercial Museum, as also by the National Association of Manufacturers and others, all of which has been inaugurated during the past six years.

Your Association should be prepared to deal with questions that concern the general interest, but which require the exercise of certain influence which shall reach all parties and in a manner to insure confidence. It is well for you to consider that these methods are now being inaugurated, and applications have been made with substantial results. Nearly all interests are coming to recognize, as never before, the value of co-operative work. In other words, there is much more than formerly a disposition to promote matters of mutual interest. It is a principle worthy of commendation.

I trust you may take favorable action in the matter of this extended service. The course will, of necessity, involve an appropriation to meet the increased expense. This could be accomplished for the present by a moderate addition to the present dues. I feel assured the results will more than justify the outlay, which I trust all members will approve.

FOREIGN MARKETS AN IMPERATIVE NECESSITY.

There are few who will question the presence of a Divine influence in human affairs. The policies and forces of nations are operating factors in the accomplishment of a pre-destined purpose. The marvelous achievements which have produced our modern civilization are the result of forces which are destined to be continued in operation until they embrace all humanity. The methods employed in the attainment of these results are means of communication, acquaintance, the establishment of confidence and the consequent relations which follow and insure trade and commerce. It is not a charity in the sense of contribution, but a practical mission operation which disburses a full measure of business profit to all engaged in its service. Can we for a moment believe that the United States of America, having attained its present position of vast power and wealth, will longer be permitted to withhold its forces and influence in the advancement of civilization? Our pathway of duty is clear and unmistakable. Americans are now preparing to take their just share and part. In the progress of events there will always appear what may be termed the natural way. It oft appears in the light of subsequent development as a predestined condition. It is a line along which people who are involved in the operations must move.

The opportunity came to us through the Hispano-American war. It was not of our seeking. Every means consistent with national honor was employed to avert it. The world is familiar with its history. The United States has accepted its results and responsibilities. In the line of our future growth and development, our Philippine possessions, apart from their own worth, will prove of inestimable value as a means of access to the trade of the East—an influence not otherwise possible.

The present troubles in China are greatly to be regretted because of the loss of life, the waste and destruction of property; yet it is but a natural result of the forces in operation, and probably necessary to the initial entry upon the work of modern civilization. The interests of the United States are of vital importance and justify the most earnest solicitude and active influence of the federal government, to the end that an open door shall be established.

The development of American industrial interest has moved with rapid strides. The achievement in all lines of useful work has been marvelous. The inventions in machinery and labor-saving devices, united with the improvement in systems and methods, have, in nearly all occupations, resulted in over production. More goods are now made than can be taken in our home markets.

Under this condition, it is impossible to steadily employ American labor. The inevitable result is disturbance of trade; it is a condition likely to occur often, the cycles of activity being of brief duration. It is therefore an evident necessity that we shall procure an outlet for our surplus products. Within the past few years very much valuable work has been done in this direction through trade organizations, and more recently important service has been rendered through the government consular service. It is a work of vital importance to the cotton manufacturing interests of the United States and demands the serious attention of this Association.

DEPRESSION IN THE COTTON INDUSTRY.

The environments of the cotton industry from a commercial point of view are very unsatisfactory. The conditions are such as to cause grave anxiety for the immediate future. The prosperity of 1899-1900 was of comparatively brief duration. We may be reasonably confident as to the causes which have produced this result, but what is the remedy?

It is possible there may be disturbances which are not yet appreciated. In its results it is an absolute and effective depression which embraces all cotton textile interests. We had acquired a foreign market for about $23,000,000 of our products. The disturbances in China, other troubles in the East and the war in South Africa, have very seriously interrupted this trade. To the extent that this applies we must abide the termination of the troubles, but the effort for other markets should be pushed with redoubled zeal.

There are other causes which have doubtless contributed to the present condition. We have but recently passed through a national election which is generally a serious factor of disturbance. Recovery from its effects is not usual until the opening of spring trade. The general conditions of trade throughout the country at present indicate substantial conditions of prosperity. The labor is being employed at good wages, and its purchasing power is unimpaired. The conditions of the cotton manufacture is in a measure complex. To a limited extent there is over-production. There is a comparatively moderate amount of goods in store. The high price of cotton occurring coincident with the abnormal depression referred to has produced a serious disturbance and the manufacturer has been unable to secure relief in the market. Reduction of wages has been talked of by some, but nearly all have agreed that such action would be ineffective. If 20 per cent. were removed from labor it would not suffice, and whatever the reduction under existing conditions a corresponding reduction of the goods would be determined in the markets. It is a serious condition and its duration under present circumstances may continue indefinitely. There is, however, means of sure relief if they could be effectively applied.

The manifest remedy is curtailment of production. If this could have been arranged to begin February 1st, and suspend operations for six weeks

during the period to June 1st, the troubles would have ere this disappeared, 400,000 bales of cotton would have been eliminated, and the market price of production would now in all probability be satisfactory. I am well aware of the difficulties in effecting such arrangements. They would generally be regarded as impractical, nay, impossible. To this view, however, I should take some exceptions, for I believe that means can be devised to meet the most difficult proposition. In other words, questions are being successfully dealt with today that would have been regarded as impossible in former times. It must be borne in mind that these troubles under existing conditions are likely to occur at more frequent intervals than we have known in the past and we should be prepared to meet them.

This is manifestly a work which justifies the serious consideration of this Association. You have the material or it is available that will enable you to render just such service as this in an effective and successful manner. It will require much effort and great skill, but the object is worth it, the end will justify the means. Individual effort, however able, would be absolutely inadequate. Important operations, such as here suggested and many other lines of useful work, are possible of achievement only through a strong Association of well organized membership.

In this connection I suggest that every proper means shall be employed to increase your list of active members and especially among mill treasurers, many of whom are with you, but all should have membership in this Association. There is sure to be important work in the future that will command their attention and justify their service.

THE COTTON INDUSTRY IN THE SOUTH.

I desire to congratulate the members and all of the people who have interests in the cotton industry of the South. I have the pleasure of a large personal acquaintance among them which began 25 years ago. How great the change since 1876. From impoverishment they have risen into a commanding position of prominence and in 1901 have realized their aspirations in the accumulation of wealth and the means for the employment of their people.

The possession of nearly 5,000,000 of spindles and the consumption of 1,600,000 bales of cotton in their manufactures, is a condition of more than local, it is of national interest. The prosperity of 20,000,000 of people in the South is of interest to all sections of the country. It is a condition even now at hand, but destined to be greatly extended with the development of the vast resources which surround them. The cotton manufacturing industry, while important, constitutes but a fractional part of the demands which are yet to be made for their labor. The South has reason to be justly proud of her achievements and grateful for the opportunities which lie before her in the future.

RELATIONS TO KINDRED INTERESTS.

In the review of this question, which is of vital interest to the North, and far more to the South than may at first appear, there are many phases of it which deserve consideration. I do not propose to enter at length upon the discussion of the subject, but simply present the general proposition, with brief suggestions. I do this from a sense of duty, but actuated by the kindliest feelings. In this connection I may be pardoned the statement. It is generally well known that for the past twenty-five years I have not only been friendly but have taken a deep interest in Southern affairs. Predictions relative to the cotton manufacturers of the South made twenty-three years since have been fulfilled. The conclusion was reached after careful study of physical and other conditions then existing. I was conscious that the operations would involve much inconvenience to Northern interests and a loss to those who failed to avail themselves of a

transfer of their coarse goods productions into the South. Other than this, upon general principles, the changes would likely be of such interest to all sections that the compensations would prove adequate.

I believed then and yet hold that view, that the South should confine its operations to the coarse goods with possible medium counts of yarn and low grade fabrics. This line would embrace to a larger extent their natural advantages. Later developments exhibit a very considerable diversification, indicating a confidence in the higher grades of fine yarns and fabrics. This action would be justified if the present conditions in respect to hours of labor and the existing prices therefor were normal and could permanently endure. It is not reasonable to suppose such a condition as possible. In the natural order the time will surely arrive when Northern and Southern interests will reach a plane of substantially uniform conditions How long a period this may involve and the extent of loss and injury which will attend the operations are questions yet to be solved.

In the South there are two states which limit the running time of mills to 66 hours per week; in others there are no restrictions. The cost of labor to the Southern mill does not exceed 60 per cent. of the cost of similar labor in the North. The running time of Northern mills is 60 hours per week, except in Massachusetts, 58 hours. Hence the difference in the cost of production upon the basis of parallel conditions is 20 per cent. in favor of the South. If the abnormal conditions, such as running time and wages, were adjusted it would remove 83 per cent. of the present inequalities and leave about 3½ per cent., net, as representing natural advantage; against this there could be no complaint.

In the natural order of development there can be no question the South will advance into a plane of equality comparable with other sections. Its labor is deserving of as much consideration as the labor of any other locality. There can be no question that the compensations would prove an adequate recompense for any immediate sacrifice. It is an important problem, one which the South must settle for themselves, ever bearing in mind the grave issues at stake. The industrial fabric within the United States is a homogenous structure; its component parts are interwoven in such manner as to compel a consistency of all its constituents. It is manifestly of deep interest to the South as well as to the North that proper and equable relations should exist. It is equally manifest that serious injury to Northern interest will react upon the South; it will be inevitable. There is a community of interest in all our domestic affairs which may for a time escape notice, but which finally compel recognition.

Natural laws may for a brief period be ignored, but they are sure to reassert their power and become operative. The 16,000,000 of spindles in the North, together with the vast number of people employed and the capital at stake, constitute forces which must be considered in the settlement of these questions. I believe it is possible to find a solution which will do injury to none but will conserve the interests of all. It is only necessary to establish the community of interest principal and secure the acknowledgment and recognition of real and genuine physical conditions when agreements would readily follow.

There is no just ground or cause for contention except for the conditions cited. The development of American industrial interests are now moving upon lines which give promise of a rapid growth in the future. In the distribution of these there there will be sufficient to satisfy the reasonable ambition of both North and South. The demand for the products of Western Europe and America are destined to equal the possible supply. It is only necessary that Americans shall perform their just share. In the securing of this trade it is important that the cotton textile interests of the United

States shall be united. Such conservation of forces would be of incalculable value. It would insure the largest possible measure of profit to the business, and to a large extent protect the industry from depressions such as exist at the present time.

I submit the several matters for your consideration, believing there are questions of grave interest at issue and such as may justify your serious attention. It is a work which must be done—if at all—through a representative body such as this Association. I am well aware that it is a difficult proposition, but trust that you will be able to devise measures to meet it. However diverse the views may be upon the first thought, a careful consideration of the subject will reveal elements in the problem of deepest interest.

Secretary Woodbury then presented his report:

THE SECRETARY'S REPORT

The gavel used at this meeting of the Association is of especial interest, being made of some of the oak timbers from No. 1 mill of the Boston Manufacturing Co. at Waltham, Mass. This mill was built in 1813 by Francis C. Lowell and his associates and was the first establishment to convert cotton into finished goods by machinery operated by power, and as such, it is the pioneer cotton mill and the precursor of this one of the world's great industries.

The details of the student's medal which was reported upon and approved at the Washington meeting, have been arranged by the Board of Government. Moses Pierce, of Norwich, Conn., an honorary member, gave to the Association on his ninety-second birthday, July 3, 1900, a sum of money which the Board of Government, with the approval of Mr. Pierce, recommended should be set aside as a fund whose income should be applied to bronze medals struck from the dies of the Cotton Manufacturers' medal and entitled the Student's Medal, one of which should be awarded for some grade of excellence to a member of the graduating class each year in such textile schools as may be selected by the Board of Government under such conditions as may be mutually determined by them and the several institutions of learning. The Board of Government reported these recommendations to the Association at its sixty-ninth meeting held at Washington, D. C., October 18, 1900, and the Association unanimously voted its approval of the plan. A special committee investigated all of the institutions in the United States known to give textile instruction, and in conformity with its recommendations, the Board of Government voted that the medals should be awarded on the basis of general excellence to one member of each graduating class as might be selected by committees of three members of the Association appointed by the President for each of the following institutions:

Lowell School of Design, Boston, Mass.

Philadelphia Textile School, Philadelphia, Pa.

Lowell Textile School, Lowell, Mass.

Georgia School of Technology, Atlanta, Ga.

New Bedford Textile School, New Bedford, Mass.

This offer has been accepted by each of these institutions of learning, and it is hoped that this Association in its purpose to develop and improve everything pertaining to the manufacture of cotton will prove to be both an incentive and a just reward to some of the future captains of the industry who are now students in the textile schools.

One element of the importance of the Transactions of this Association is the frequency with which citations are desired from these volumes by members and visitors and also in the routine work of the office. While the later volumes are provided with indices, yet there is need of a full index of the whole set, and the Board of Government has authorized the preparation of a card index which the

experience of the past few years indicates will serve a highly useful purpose. The preparation of this card index will require a long time as an examination of the Transactions to date estimates that it will require 9000 cards for this purpose.

The mortality of the members of the Association has been unusually large during the past year, as is shown by the death of the following 15 members: Jones S. Davis, B. A. Alexander, Charles L. Bailey, John W. Dickinson, John Waterman, Moses Pierce, Stephen L. Adams, John Holland, James Renfrew, Arba C. Slater, Robert H. Smith, W. L. Hutchins, Winthrop Thayer, James G. Hill and George F. Tryon, biographical sketches of whom will appear in the volume of Transactions for the year. At the beginning of the year the membership of the Association was 563, which has been increased by the election of 78 at the spring and fall meetings. This number has been diminished by the death of the 15 referred to, by the resignation of 8, dropping on account of lapsed dues of 3 and non-confirmation of election by 1, leaving in advance of this meeting a net membership of 614.

H. G. McKerrow, Boston, Mass., read a paper at the opening of the afternoon session, entitled, a Modern Textile Machine Building Plant. He described the machine shops of Messrs. Tweedales & Smalley of Castleton, near Manchester, Eng. The lecture was illustrated by the stereopticon with views taken both inside and outside of the works, and showed the facilities not only for doing good work, but a large amount of it, possessed by this firm. We regret that our space in this issue does not permit of a reproduction of the views, which are essential to an appreciation of Mr. McKerrow's lecture.

A. C. Kittredge, C. P. A., then read a carefully prepared paper on Accounting for Cotton Mills.

The next paper was by C. E. W. Dow, Atlanta, Georgia, entitled, Humidifiers in Cotton Mills. Mr. Dow did not attempt to treat this subject from a scientific standpoint, considering that this had already been done very thoroughly, but confined himself to some personal experiences in connection with humidifying in cotton mills. His remarks were very interesting and instructive, giving as they did the observation of a practical man on a subject of great importance in cotton manufacture.

The next paper was entitled, Friction Clutches in Cotton Mills, and the Philips Clutch, by Thomas Henry Smith, Jamestown, N. Y. Mr. Smith described the Philips Clutch, explaining its working to his hearers by means of a working model; this clutch has been used for nearly two years in Mr. Smith's mill, transmitting 150 horse power; and it was, therefore, upon practical experience that Mr. Smith based his confidence in the merits of the clutch.

The first paper read at the morning session, April 25, was on Industrial Unity, by Herbert E. Walmsley, New Bedford, Mass. Mr. Walmsley showed very clearly the community of interests which existed between what is commonly called labor and capital, dwelling upon the folly of strikes and lock-outs as a means of adjusting differences.

The next paper was entitled, Possible Additional Economies at the Steam End of the Mill, by Crosco C. Woolson, New York. He was followed by Francis H. Boyer, who read a paper on Water Cooling Towers and Positive Steam and Oil Separating.

The next paper was entitled The Cloth Room, its Arrangements and Needs, by Arthur F. Gray, Mill Engineer, Boston, Mass. He considered the best arrangement for a large production of perfect goods, and spoke of how to obtain the best light for inspecting the goods.

At the afternoon session on April 25th the following members were elected:—

ACTIVE MEMBERSHIP.

Nathaniel F. Ayer, assistant manager Farwell Bleachery, Lawrence, Mass.; Peter H. Corr, treasurer Greenwich Bleachery, Taunton, Mass.; Wm. J. Cray, superintendent Aldrich Mfg. Co., Moosup, Conn.; Albert Deabell, superintendent Lowell Hosiery Co., Lowell, Mass.; Robert Dow, Solway Mills, Westerly, R. I.; Henry C. Dexter, agent Greene & Daniels Mfg. Co., Pawtucket, R. I.; Frederic C. Dumaine, treasurer Amory Mfg. Co., Manchester, N. H.; Chas. W. Fisher, assistant superintendent Fisher Mfg. Co., Fisherville, Mass.; Wm. H. Greene, treasurer Green & Daniels Mfg. Co., Pawtucket, R. I.; A. E. Henry, of the Solway Mills, Westerly, R. I.; Walter B. Hall, superintendent Boston Duck Co.; T. I. Hickman, president and treasurer Graniteville Mfg. Co., Augusta, Ga.; Otis L. Humphrey, cotton department Lowell Textile School, Lowell, Mass.; George A. Hard, superintendent Cocheco Mfg. Co., Dover, N. H.; John Edward Lawton, governing director American Thread Co., Mattock, Derbyshire, England; A. Lawrence Lowell, trustee Lowell School of Design, Boston, Mass.; Frederick B. Macy, treasurer Soule Mills, New Bedford, Mass.; John Neild, superintendent Wamsutta Mills, New Bedford, Mass.; Henry Osgood, superintendent W. A. Slater Mills, Jewett City, Conn.; Chas. H. Potter, superintendent Montreal Cotton Company, Valleyfield, Canada; Franklin D. Williams, treasurer Fiskdale Mills, Boston, Mass.

ASSOCIATE MEMBERS.

John O. DeWolf, mechanical engineer, Boston, Mass.; Fred. W. Easton, treasurer Easton & Burnham Machine Co., Pawtucket, R. I.; Lemuel R. Howe, dealer in dyestuffs, Boston, Mass.; John McCulloch, dealer in cotton waste, New Bedford, Mass.; George I. Rockwood, mechanical engineer, Worcester, Mass.; L. A. Schwartz, importer of textile machinery, New Bedford, Mass.; H. A. Tillinghast, treasurer Granger Foundry & Machine Co., Providence, R. I.; Clement A. Wakefield, selling agent Saco & Pettee Machine Shops, Biddeford, Me.

A discussion of the proposed unification of the numbering of yarn by international agreement followed. The proceedings of the international congress for the unification of yarn numbering, held at Paris last year, had been translated by the Secretary, and formed the basis for the discussion Our readers are already familiar with what has been done at this congress. The discussion was participated in by Mr. C. P. Brooks, Arthur H. Lowe, and Mr. Arnold B. Sanford; all of the speakers agreed upon the desirability of uniform yarn numbering, about which there is very little difference of opinion. The difficulty comes from effecting to change. Mr. Sanford stated that he thougnt it would be to the credit, as well as for the benefit of the industries of the United States to promote this unification of yarn numbering, basing the new system upon the Metric Weights and Measures. He called attention to the need in this country of export business, and stated that it would be a great advantage in transacting business with foreign countries to use the same system of measurements employed by our foreign customers.

The next business was the reading of a paper by Charles W. Dennett, North Adams, Mass., on Overseers and Overseeing. The next paper was entitled, Some of the Troubles to Manufacturers Arising from Dyed Yarns, by Farquharson J. Muir, Milltown, N. B. These two very interesting and instructive papers appear in another part of this issue of the Textile World.

The next and last paper was entitled, A Little Study in Lugstraps for Broad Box Looms, by Frank P. Vogel, Claremont, N. H., as follows:—

The figures following represent the cost per pound of goods manufactured for lug straps in years specified, viz.:

Year ending—	
Nov. 30, 1896	.000442
Nov. 30, 1897	.000413
Nov. 30, 1898	.000862
Nov. 30, 1899	.000252
Nov. 30, 1900	.000211

For many years we have been using straps made of canvas and raw hide, canvas inside and raw hide outside, and with satisfactory results, but in the early part of 1898 I noted the straps did not last as long as formerly and the raw hide seemed rotten; after complaining to party furnishing our straps with no better results, I commenced trying stitched leather and other styles of straps, but we still used too many, and, after a trial on a few looms, early in 1899 we adopted the Roller Cushion Lug Strap, and the cost per pound of goods manufactured in the years 1899 and 1900 justifies the change. I give this small item from my experience in hopes it may help others, and also as an aid to our

worthy Secretary in his efforts to have more short papers from members of Association on the every-day happenings that come under their observation and notice.

The election of officers resulted in the choice of the following gentlemen:—Charles H. Richardson, agent Lancaster Mills, Clinton, Mass., for president; for vice-president, George H. Hills, treasurer Davol Mills and Stevens Manufacturing Co., Fall River, Mass.; Charles H. Fish, agent Cocheco Manufacturing Co., Dover, N. H.; Geo. F. Whitten, agent Amory Manufacturing Co., Manchester, N. H., and W. B. Smith Whaley, president Richland and Granby Cotton Mills, Columbia, S. C., were nominated to serve on the board of directors for three years, and William B. Hartshorne, superintendent Arlington Mills, Lawrence, Mass., for two years. Since the meeting was held, Mr. Richardson finds it necessary to decline the election to the office of President, through press of other business, and the board of directors will soon be called together to choose his successor.

Following is a list of those present:

MEMBERS.

Alfred E. Adams, Whitinsville, Mass.; Joseph D. Aiken, Taftville, Conn.; Thomas Armstrong, North Pownal, Vt.; Joseph P. Battles, Lewiston, Me.; George W. Bean, Lewiston, Me.; Robert Beatty, Lewiston, Me.; Richard P. Borden, Fall River, Mass.; Christopher P. Brook, New Bedford, Mass.; Robert Burgess, New Bedford, Mass.; Edward N. Burke, Lowell, Mass.; Clarence N. Childs, Lowell, Mass.; J. H. C. Church, Great Barrington, Mass.; Frank P. Comins, Boston, Mass.; P. T. Creed, Taunton, Mass.; Woodbury K. Dana, Westbrook, Me.; Charles W. Dennett, North Adams, Mass.; Edward P. Dennis, Lowell, Mass.; Charles A. Denney, Leicester, Mass.; George Otis Draper, Hopedale, Mass.; Russell W. Eaton, Brunswick, Me.; John Eccles, Taftville, Conn.; Frederick W. Ely, Greenville, N. H.; James T. Ferguson, Lowell, Mass.; Charles H. Fish, Dover, N. H.; Herbert Fisher, Taunton, Mass.; Frederick A. Flather, Lowell, Mass.; M. F. Foster, Milford, N. H.; Charles E. Getchell, Waltham, Mass.; George P. Grant, Jr., Fitchburg, Mass.; D. W. Gray, Utica, N. Y.; R. A. Gray, Allenton, R. I.; John Gregson, Fiskedale, Mass. Arthur H. Gulliver, Waltham, Mass.; Frank J. Hale, Newton Upper Falls, Mass.; John F. Hamlett, Fall River, Mass.; Henry F. Harris, Worcester, Mass.; William R. Hill, South Hadley Falls, Mass.; Franklin W. Hobbs, Boston, Mass.; Charles M. Holmes, Manchaug, Mass.; George W. Holt, Putnam, Conn.; David S. Johnston, Cohoes, N. Y.; John Kilburn, Belmont, Mass.; Harry W. Kimball, Bath, Me.; Jesse A. Knight, Providence, R. I.; Stephen A. Knight, Providence, R. I.; Evan Arthur Leigh Boston, Mass.; J. Colby Lewis, Charleston, S. C.; Arthur H. Lowe, Fitchburg, Mass.; William T. Lyall, New York city; Charles H. Manning, Manchester, N. H.; Henry D. Martin, Newry, S. C.; Thomas Mayor, Providence, R. I.; William P. McMullan, Salem, Mass.; W. H. Miles, Lisbon, Me.; J. R. Montgomery, Windsor Locks, Conn.; Albert H. Morton, Lowell, Mass.; Farquharson J. Muir, Milltown, N. B., Canada; Walter E. Parker, Lawrence, Mass.; William E. Pierce, Providence, R. I.; Haven C. Perham, Lowell, Mass.; Albert R. Pierce, New Bedford, Mass.; J. F. Powers, North Adams, Mass.; Herbert L. Pratt, Lewiston, Me.; John E. Prest, Cohoes, N. Y.; M. W. Quinn, Amesbury, Mass.; T. G. Ramsdell, Housatonic, Mass.; T. H. Rennie, Graniteville, S. C.; Walter Rigby, Providence, R. I.; Charles D. Robinson, Crompton, R. I.; Arnold B. Sanford, Boston, Mass.; Thomas C. Sheldon, Fitchburg, Mass.; William F. Sherman, Boston, Mass.; Herbert H. Shumway, Taunton, Mass.; George E. Spofford, Blackstone, Mass.; T. B. Stevenson, Hyde Park, Mass.; Robert Stewart, Woonsocket, R. I.; James W. Taylor, Taunton, Mass.; Edward W. Thomas, Lowell, Mass.; D. M. Thompson, Providence, R. I.; Oscar B. Truesdell, Newtonville, Mass.; Frederick T. Walsh, Boston, Mass.; Joseph Watters, Fall River, Mass.; F. E. Wattles, Penacook, N. H.; Joseph W. Wattles, Canton Junction, Mass.; George W. Weeks, Clinton, Mass.; W. B. Smith Whaley, Columbia, S. C.; Franklin D. Williams, Boston, Mass.; Channing Whitaker, Lowell, Mass.; Alfred N. Whiting, Oakdale, Mass.; William Whittam, Jr., Woonsocket, R. I.; Benjamin Wilcox, New Bedford, Mass.; John B. Wild, Utica, N. Y.; Broadus E. Willingham, Macon, Ga.; C. J. H. Woodbury, Lynn, Mass.

ASSOCIATE MEMBERS.

Eugene C. Andres, Boston, Mass.; H. B. Ashton, Medford, Mass.; Henry Ashworth, Fall River, Mass.; J. Frank Braids, Providence, R. I.; Henry G. Brinckerhoff, Boston, Mass.; D. Russell Brown, Providence, R. I.; John H. Burghardt, Boston, Mass.; Eugene E. Burnham, Lawrence, Mass.; Harry W. Butterworth, Philadelphia, Pa.; Malcolm Campbell, Woonsocket, R. I.; John O. De Wolf, Boston, Mass.; Fred H. Easton, Pawtucket, R. I.; W. W. Carey, Lowell, Mass.; Thomas G. Cox, Taunton, Mass.; Joseph L. Cushing, Lowell, Mass.; Frederick J. Dana, Providence, R. I.; C. E. W. Dow, Atlanta, Ga.; G. B. Emmons, Lawrence, Mass.; H. P. Garland, Biddeford, Me.; Royal W. Gates, Lowell, Mass.; Sumner S. Gould, Lowell, Mass.; William S. Granger, Providence, R. I.; Arthur F. Gray, Boston, Mass.; Alfred H. Hartley, Fall River, Mass.; Richard H. Hill, Boston, Mass.; David Jackson, Pawtucket, R. I.; Frank B. Kenney, Lowell, Mass.; Samuel D. Lawton, Fall River, Mass.; Stephen C. Lowe, New Bedford, Mass.; H. G. McKerrow, Boston, Mass.; D. K. McLaren, Montreal, P. Q., Canada; Charles B. Moore, Boston, Mass.; George B. Morison, Boston, Mass.; John H. Nelson, Boston, Mass.; William R. Noone, Boston, Mass.; Sidney B. Paine, Boston, Mass.; Arthur Parkinson, New York, N. Y.; Charles A. M. Praray, Providence, R. I.; E. R. Richardson, Pawtucket, R. I.; John M. Rus-

sell, Worcester, Mass.; John E. Searles, New York, N. Y.; Harry M. Smith, Providence, R. I.; Henry C. Spence, Indian Orchard, Mass.; George W. Stafford, Providence, R. I.; H. E. Stafford, Providence, R. I.; Lettice R. Washburn, New Bedford, Mass.; H. A. Tillinghast, Providence, R. I.; Clement A. Wakefield, Biddeford, Me.; W. W. White, Worcester, Mass.; Frederick A. Wilde, Pawtucket, R. I.; Erving Yale Woolley, Boston, Mass. Others in attendance were E. A. Robinson, Lowell, Mass.; John Sullivan, Fall River, Mass.; C. H. Truesdale, Killingly, Conn.; Charles H. Hobbs, Thorndike, Mass.; Charles D. McDuffie, Manchester, N. H.; Frederick W. Moore, Millbury, Mass.; C. H. Frisbie, Norwich, Conn.; A. F. Brackett, Riverpoint, R. I.; Edward R. Ballou, Providence, R. I.; Joseph H. Potter, Fall River, Mass.; H. Martin Brown, Providence, R. I.; Herbert E. Walmsley, New Bedford, Mass.; B. B. Comer, Birmingham, Ala.; Edward A. Mongeon, Lonsdale, Mass.

GUESTS.

Among the guests and associate members present, were: Arthur Johnson, Oldham, England; S. C. Lowe, New Bedford, Mass.; J. F. Havey, Boston, Mass.; L. H. Schwartz, New Bedford, Mass.; H. C. Spaulding, Boston, Mass.; R. W. MacAllister, Cohasset, Mass.; C. R. Marden, Boston, Mass.; J. O. DeWolf, Boston, Mass.; Henry G. Kittredge, Boston, Mass.; G. H. Woraf, Laconia, N. H.; John W. Mator, Providence, R. I.; Edward F. Rice, Lawrence, Mass.; Percy Bennett, Boston, Mass.; Milton D. Brown, Providence, R. I.; H. L. Reynolds, Lowell, Mass; Louis B. Magid, Milford, Mass.; M. A. Hayes, Boston, Mass.; W. C. Harrison, Boston, Mass.; Frederick Ott, Pawtucket, R. I.; J. W. Ballard, Boston, Mass.; Thomas B. Doolittle, Boston, Mass.; H. W. Church, Lowell, Mass.; L. R. Howe, Boston, Mass.; F. G. Trunkett, Boston, Mass.; F. A. Chase, Boston, Mass.; L. M. Foss, Lowell, Mass.; H. G. Lord, representing the Textile World; A. F. Ray, Boston, Mass.; James B. Jones, Philadelphia, Pa.; W. A. Clark, Columbia, S. C.; W. W. Ballagh and C. H. Barclay, New York; Charles T. Slack, Fall River, Mass.; J. A. Brock, Anderson, S. C.; L. B. Schwartz, Woonsocket, R. I.; L. W. Campbell, Woonsocket, R. I.; Rodney Thayer, Boston, Mass.; Dr. L. White, Natick, Mass.; J. A. Cooper, Whitinsville, Mass.; H. C. Eccles, Charlotte, N. C.; A. W. Noone, Peterboro, N. H.; J. Goff, Charlotte, N. C.; W. J. Hartford, Saylesville, R. I.; John S. Merchant, Providence, R. I.; B. S. D. Martin, Providence, R. I.; E. W. Davenport, Providence, R. I.; A. B. Hitchins, Saugus, Mass.; Daniel Jackson, Providence, R. I.; C. M. Clay, Boston, Mass.; E. H. Mullen, New York; S. S. Dale; S. S. Paine, Newton, Mass.; B. F. Howes, Shirley, Mass.; H. Stevenson, Boston, Mass.; R. W. Swift, Boston, Mass.; Frank Nagle, Boston, Mass.; W. C. Nairn, North Cambridge, Mass.; M. H. Coffin, Whitinsville, Mass.; F. B. Marcy, New Bedford, Mass.; Edmund Noble, Boston, Mass.; H. G. Beede, Pawtucket, R. I.; F. H. Burt, Boston, Mass.; B. P. Palmer, Boston, Mass.; J. P. Reynolds, Boston, Mass.; Dwight Seabury, Providence, R. I.; Walter L. Lane, Boston, Mass.; A. C. Larkin, Boston, Mass.; C. M. Wheaton, Boston, Mass.; A. S. Kellogg, Boston, Mass.; F. S. Sweet, Providence, R. I.; C. H. Noone, Dorchester, Mass.; D. E. Blake, Newton Highlands, Mass.; W. P. Cothrin, Boston, Mass.; C. W. Peirce, Charlotte, N. C.; J. J. DeLong, New York; Hans Mink, Vienna, Austria; E. C. Farnsworth, Providence, R. I.; W. H. Harris, Charlotte, N. C.; David Jackson, Pawtucket, R. I.; J. T. Thornton, Providence, R. I.; J. F. Searles, Readville, Mass.; Thos. Henry Smith, Jamestown, N. Y.; E. L. Merrow, Providence, R. I.; D. W. Bugbee, Lowell, Mass.; John McCullough, New Bedford, Mass.; C. F. Burnham, Saylesville, R. I.; L. A. Lockwood, Saylesville, R. I.; George F. Tucker, New Bedford, Mass.; A. Woodbury, Boston, Mass.; George H. Sherman, Worcester, Mass.; C. A. Tabor, Thorndike, Mass.; W. J. Denny, Lowell, Mass.; Hon. Thomas N. Hart, Boston, Mass.; Henry S. Pritchett, Boston, Mass.; A. O. Kittredge, New York, N. Y.; Francis H. Boyer, Somerville, Mass.; Orosco C. Woolson, New York, N. Y.; E. E. Austin, Providence, R. I.; Antonia Spencer, Providence, R. I.; C. L. Messinger, Boston, Mass.; A. A. Aspinwall, Pawtucket, R. I.; James Murkland, Lowell, Mass.; E. B. Townsend, Lowell, Mass.; W. J. Curit, Boston, Mass.; J. D. Whittaker, Boston, Mass.; J. J. Mitchell, Jr., Boston, Mass.; William White, North Adams, Mass.; E. T. Fowler, Westfield, Mass.; J. A. Mitsch, Boston, Mass.; A. D. Smith, New Bedford, Mass.; C. E. Childs, Northampton, Mass.; G. F. Steele, Boston, Mass.; William R. Roney, New York, N. Y.; Nathaniel Bike, Boston, Mass.

—The strike at Marseilles, which interrupted the supply of cotton entering France, was almost immediately followed by the closing of many cotton mills in the Vosges district. This is a conclusive sign that the mill storehouses which were emptied of their stock of cotton during the scarcity last summer, have not yet been refilled.

—The German government require that cloth for the navy shall be dyed with natural indigo. Tests are now being made by the government of goods colored with the artificial product, and, if the results are satisfactory, preference will be given to artificial indigo, which is at present an exclusively German product.

—The condition of woolen manufacturing in Canada is growing worse, the longer the preferential duties in favor of British goods are in force. The mill owners have become tired of bearing the burden, and propose to invite their employees to share it with them, by submitting to a reduction of wages.

Silks.

In the realm of Silkdom domestic manufacturers seem to have almost surpassed themselves this season and the number of marvelously beautiful cloths that have been placed on the market leaves no room for doubt that Americans need no longer look beyond the ocean for the choicest productions of the silk loom but may find them right here at home.

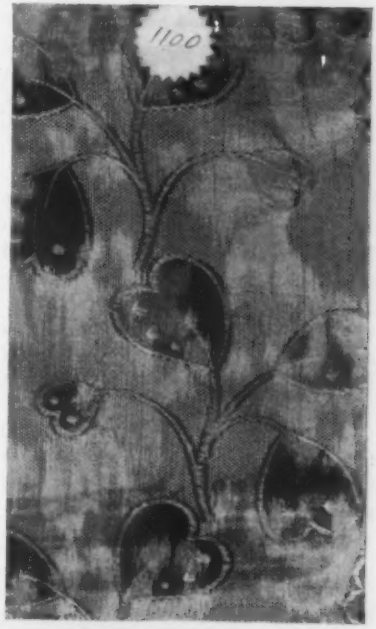
In the plain colored cloth possibly no particular weave has enjoyed the popularity of the beautiful, filmy, clinging crepe de chene so well adopted for evening wear. One of the good sellers from the line of A. D. Juilliard & Co. is sold at 75c. reg. less 6 per cent. 10 days. This cloth is made up in all the popular shades, evening shades of course being the favorites in a cloth of this construction.

Early in the season a tendency was noticed towards a revival of print warps which developed strength as the season advanced until at the present moment there is nothing else so popular in the way of fancies. A satin striped, print warp Louisine was sold by Wm. Schroeder & Co. in a variety of combinations of coloring, price 95c. reg. No. 1000 from the same concern represents a printed warp fabric checked by the weave, which has been a great success at $1.05. No. 1100 represents what we consider one of the most beautiful cloths shown this season. This is also from Wm. Schroeder & Co. and is sold at $1.25, 6 per cent., 10 days. It is a printed warp effect on a cloth on the Louisine order with a Jacquard vine and leaf pattern.

In lower priced fancies sample 1200 represents a corded and hemstitched taffeta which was very readily sold by Silberstein, Castell & Co., at 5½c. reg.

Open work and hemstitched effects in the higher grade goods have also been in strong favor. One from Taylor & Fessenden with Schefer, Schram & Vogel, in a corded open work effect on a pallais de soie cloth, was freely sold at $1.25.

The last few weeks have developed quite a strong demand for Roman



stripes in taffetas, Louisines, etc., and at the present writing everything of this description that is offered is readily marketed. No. 1400 in a beautifully finished Louisine weave with very tasteful Roman stripe color combinations, is made and sold by Doherty & Wadsworth at 75c. reg. A fabric from Schefer, Schram & Vogel in a similar weave, but in brilliant colorings and wider stripe groupings, has been another good seller at the same price, 75c. reg.

The Roman stripe while very effective and in strong demand, is undoubtedly only a passing fancy, and will in all probability drop out as quickly as it came in, consequently it behooves the manufacturer and merchants to touch this class of goods very lightly; for, while they are good property today, they may be "very, very dead" tomorrow, and a Roman stripe under ordinary circumstances is exceedingly slow moving merchandise.

Panne Velvets.

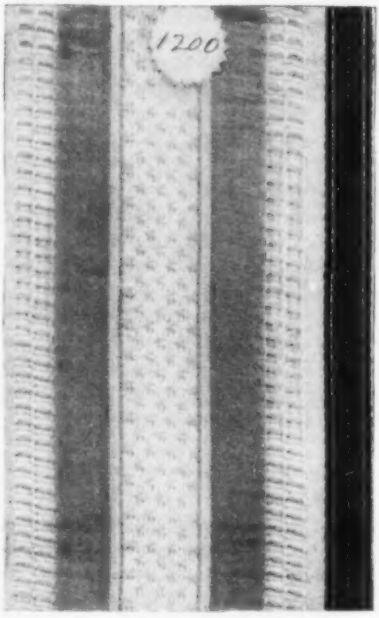
The popularity of Panne velvet, which was such an important feature in last season's business, bids fair to continue, and a good business both for the present and future delivery is being done on this class of merchandise.

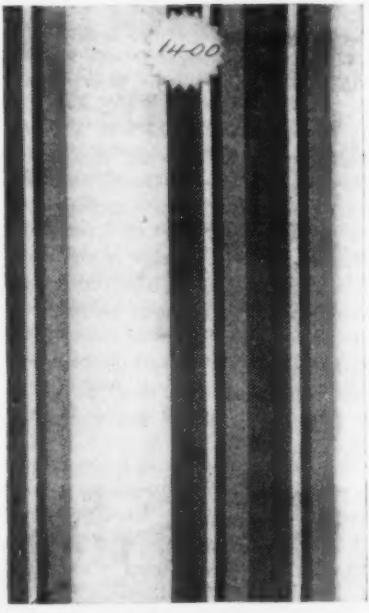
Plain Panne will of course be strong but the demand for fancy prints will, according to the present indications, be stronger this season than last.

Again the American manufacturer asserts himself, and some of the productions seem almost as though from fairy land. No. 1600 shows a beautiful Persian design sold in four different color combinations, and No. 1700, a floral design, which appeared in six beautiful colorings both on a brilliant cloth of exquisite finish and sold by Cozzens, Elber & Prankard at $1.00 reg. What need to go abroad after novelties when such creations as these may be had at our very doors?

Fancy Cotton Waistings.

When any particular class of goods has touched the popular fancy and reached a fair degree of popularity it is immediately copied by the manufacturer of lower priced goods. This applies to the fancy waistings in higher priced silk striped flannels, etc., which





were so popular earlier in the season and which are now being very cleverly copied in cotton goods by domestic manufacturers.

Sample No. 700 represents a line of beautifully finished mercerized striped, all cotton waistings, 27 inches wide, placed on the market by H. C. Childs, New York, at 13½ cts. net; 2 per cent., 10 days, fall dating. They are sold far in advance on this fabric and cannot take orders for delivery before July or August. This fabric weighs 3 ozs. per yard. Warp 64 threads per inch, 2/40s cotton; filling 46 threads per inch 1/22s cotton.

Men's Wear Woolens.

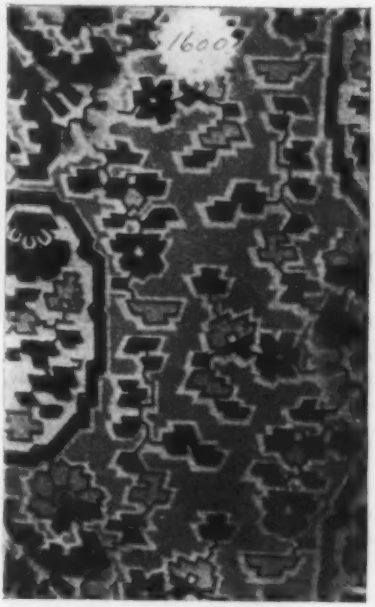
Unfinished worsteds for men's wear still maintain their popularity among the heavy weight goods for fall and as the season advances there is no indication that they are to be replaced in popular favor by any other make of goods.

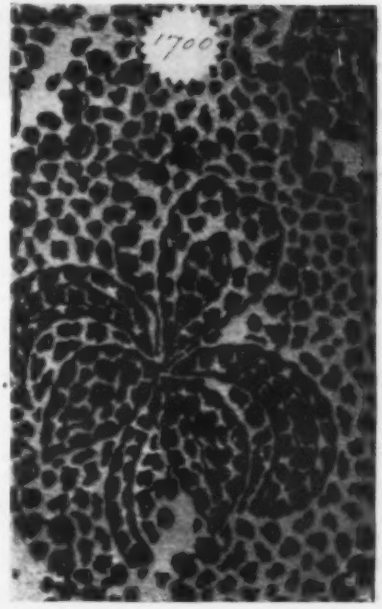
The American Woolen Co. have done a large business on an unfinished worsted No. 300. These goods are the regular 6/4 width and sell at $2.00 reg. This fabric weighs 19 ozs. per yard; warp 6000 ends, 2/30s worsted; filling 56 picks per inch 2/30s worsted; Saxony finish. There is also, of course, a certain demand for cassimeres and finished worsteds. This company have been very successful on some grades of finished worsteds selling at $2.12½. A good business has been done on the cassimere selling at $1.37½.

Ladies' Wear Woolens.

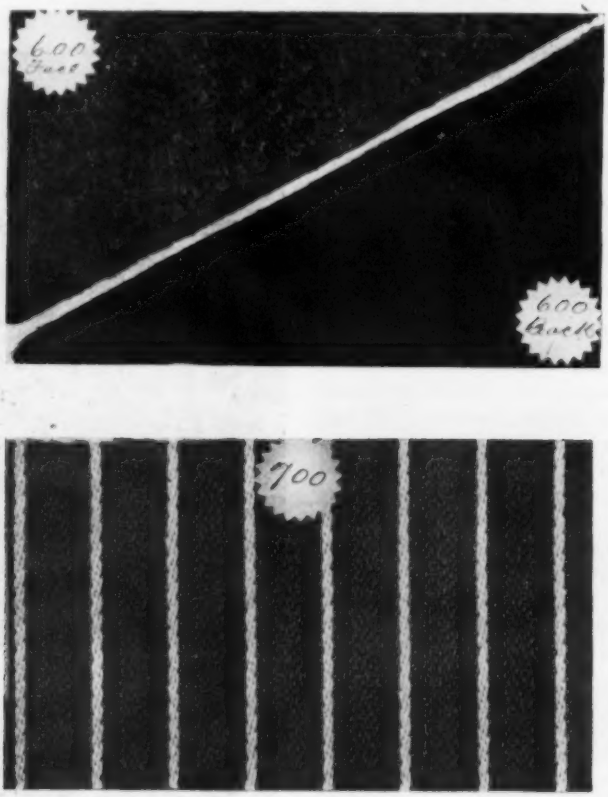
The plaid back cloth for ladies' wear has had a most decided set back and it is generally considered that it has gone for good this time, although there are some who prophesy that it will again come into popular favor later in the season, but at the present time there is certainly not the slightest indication that such will be the case.

The double faced cloth of two solid colors bids fair to replace the plaid back in popular favor, and many styles are being shown both for present delivery, and for fall. The Allen-Lane Co. have placed a fabric of this description (No. 600) on the market this season at $1.42½ reg., which has been





a very good seller. This cloth weighs 21½ ozs. per 6/4 yard. Warp, 70 threads per inch; filling 54 threads per inch; yarn 3¼ runs.



Textile Conditions in Yorkshire.

Special Correspondence of the Textile World.

S. B. H.

Although the Yorkshire American trade in woolens and worsteds is today a subject causing much heartburning in manufacturers of Bradford, Leeds, Dewsbury and Huddersfield, owing to lost trade, it is nevertheless a fruitful topic of interest to American manufacturers to know what is being done by their opponents here, and having a practical interest in the manufacture of textile fabrics in this large textile district of the West Riding of Yorkshire, I will try to say something of interest to all.

Without the shadow of a doubt, this whole district has missed very much its American trade, which it ever looked upon as one of its preserves, and which it regarded as a "safe" market when other outlets were indifferent. But the late showing of the Bradford exports to the United States indicates clearly enough that the trade between this centre and America is growing less and less, and the day is not far distant when American manufacturers will be supplying their own markets to which they have the first claim.

At the same time manufacturers here are in no sense indifferent to the needs of the American market, and even yet many are straining every nerve in catering to the needs of your states. The lately decreased exports of the last two months has taken the

wind out of the sails of many in this district, and manufacturers are now beginning to see that they have received permanent notice to quit. Needless to say a great many Bradford shipping houses with the closing of American ports have turned their attention during the past year to the home markets, and such large firms as A. & S. Henry, and Charles Seman & Co., both big Bradford houses, are doing a very extensive home trade. This means that competition in our own markets is keener than ever, the effect being that we are importing less textile manufactures from France, Belgium, and Germany, and if our home trade could be wrested entirely from the hands of our Continental rivals, it would be five times more valuable than all the American trade which textile Yorkshire ever did with the United States; but I fail to see so long as our free trade policy holds sway and so long as our home markets are open to Continental manufacturers, how our producers here can hope to supply our home trade wants in their entirety.

It may interest American manufacturers to know that not many weeks ago I was shown in a large shipping warehouse in Bradford, several ranges of fancy woolen tweed mixtures made in Belgium, which fairly took my breath away. The manager of the woolen department of an American house asked me to come in and inspect several new ranges which had been sent to them and which they were sending out to foreign centres other than your states, knowing that the tariff there completely excluded them. I accordingly went and had my eyes thoroughly opened. "Name the price," I said to my friend, and he quoted me 23 cents per yard, 55 inches, 16 ounces, for a splendid fancy check fabric, well suited for wholesale clothiers. Just imagine this price for a nice attractive fabric which an inexperienced man on the street would take to be a good cloth. I analyzed it and found the fabric was composed of 75 per cent. of cotton, spun thick and twisted, and made to look really smart.

Two more ranges were shown me, one at 28 cents, and another at 32 cents; for the latter figure a fabric was shown which I for one would not be ashamed to wear on Bradford Exchange. Talk about marvels of cheapness; why the wonder to me is how they were done; and if the materials were obtained for nothing, the cost of production could not have left a great amount of profit. The colors and blending together with the design were admirable, and as these were "regular" lines and could be repeated, it shows what is being done by manufacturers in the Old World.

We have makers here in the Dewsbury district and up the Colne Valley who are producing some fine things from 36 cents and upwards, 54 inches, but the manager frankly admitted that they could not equal these Continental fabrics by pence per yard. There is no doubt whatever that our home woolen manufacturers are being under-sold by their German rivals in such a centre as Leeds, where it is known heavy weights of Continental woolens are cut up every week.

Readers may not know that the City of Leeds is now turning out more "ready mades" than any other city in the known world, several large Glasgow houses having removed their plant to this centre during recent years. Our manufacturers are having to stand aside and watch the import every month of 450,000 to 600,000 yards of woolen manufactures made of wool other than goat's hair or wool mixed with cotton, and 7,500,000 yards of woolen stuffs, together with carpet and rugs valued at nearly $250,000. These figures are taken from the Board of Trade returns for March, 1901. Under these conditions it is only natural that in certain quarters there is some heart-burning over Continental textile manufactures being imported.

The question of the price of yarns

will interest United States manufacturers very much, and I here give a few tables of current prices, comparing them with those current at the corresponding period a year ago.

PRICES OF STANDARD YARNS.

Description of yarn.	April 1901 Cents.	April 1900 Cents.
1/40s Cotton Egyptian warps,	24	29
2/28s Alpaca ordinary, per lb.	33	37
2/40s Botany mixtures, per lb.	64	82
2/40s Botany, in oil, per lb.	47	62
†2/60s Botany, per lb.	54	72
*1/60s Botany, per gross,	126	180
2/40s Mohair medium, per lb.	85	90
2/32s Mohair ordinary, per lb.	58	66
2/32s Mohair super, white, per lb.	90	94
2/40s Worsted, in bundle, per lb.	32	37½
2/32s Worsted ordinary, per lb.	44	32
1/30s Demi-color, per gross,	174	198
1/30s Demi-lustre, per gross,	132	164
1/30s Super lustre, per gross,	200	212

*For super 60s add 6 cents per gross; for common 60s 6 cents per gross less.

†2/48s 4 cents per lb. less.

I asked one of our leading spinners the other day to give me a price list of his yarns as he was selling them today, and the following table affords good data to every United States manufacturer. The yarns are spun from the quality of wool enumerated:

Length	40s qual. Cents.	44s qual. Cents.	60s qual. Cents.	70s qual. Cents.
2/24s	29	33	48	51
2/28s	29½	33½	48½	51½
2/32s	30	34	49	52
2/36s	31	35	50	54
2/40s	..	37	51	55
2/44s	..	37	52	56
2/48s	..	..	53	57
2/52s	..	..	54	58
2/56s	..	..	55	59
2/60s	..	..	58	62

Worsted coatings have always been looked upon as one of the staple products produced in Bradford and district, very large quantities having been shipped to the United States during recent years. Unfortunately this class of fabric has fallen upon evil times, and less quantities than ever are being shipped across the herring pond. This is purely brought about by the high tariff, but American manufacturers will learn with no surprise that they can be bought today at as low a figure as ever they could, and were there any relief on the question of the tariff, American made goods would encounter severe competition from this end of the world.

Looms here are being rather badly run on worsted coatings, this class of fabric being by no means popular on the street today. At the same time it is one of those "bread and cheese" articles which will ever find a sale, and manufacturers can make the cloth when they have nothing else to do with the certainty that they will sell some time. The following are current prices for worsted coatings, and as showing how they have fallen I give the price per yard when they were at the top together with those current today:

PRICES OF WORSTED COATINGS.

Width. Inches.	Worsted coatings.	Weight, ozs.	Price per yard, Jan. 1900. Cts.	Price per yard, Apr. 1901. Cts.
55	60s quality	12	60	48
55	"	14	66	30
55	"	16	72	36
55	"	18	80	43
55	"	20	88	74
55	"	22	96	84
55	"	24	104	92
55	50s quality	12	54	41
55	"	14	60	49
55	"	16	66	56
55	"	18	72	62
55	"	20	80	68
55	"	22	88	75
55	"	24	96	84

For blacks it is customary to sell at 2 cents per yard less than blues.

Improved Carding Engine.

MESSRS. JOHN HETHERINGTON & SONS, LIMITED, POLLARD ST., ANCOATS, MANCHESTER.

A new carding engine, which has received the appropriate name, "New Century," was completed early this year by the firm of John Hetherington and Sons, Ltd., of Manchester, Eng., whose agent in this country is S. C. Lowe, 186 Devonshire Street, Brewer Building, Boston, Mass.

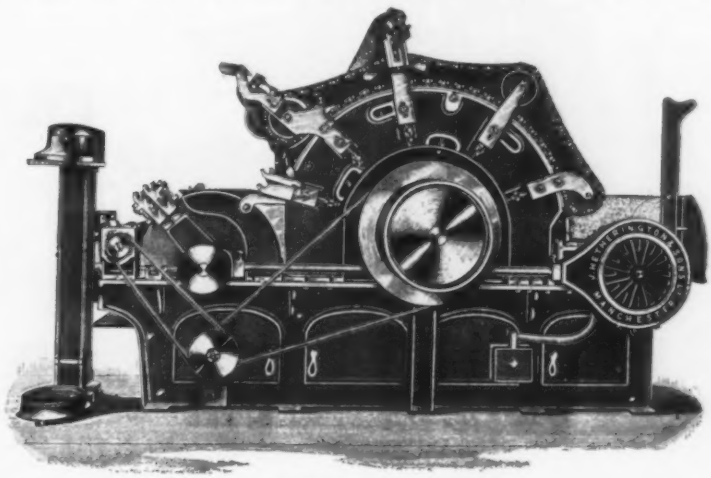
It shows a distinct variation, in more than one part, from the usual type of carding engine, perhaps the most noticeable feature being its reduced height. The reduction amounts to 4 in., which, although slight, gives the machine a much more compact appearance and leaves every part within reach. In spite of this reduction of height, the space between the chain of flats has been greatly increased, as

will be seen by reference to Figs. 1 and 2, which illustrate the machine from both sides. This increase of space makes it much easier for setting and cleaning operations, as will be readily understood.

The flexible bends are placed inside the framing close to the cylinder, which is clothed quite up to the edge. It is therefore only necessary for the flat to exceed the width on the wire by about 2 inches, which is just about the space taken by the bearing surfaces. This ensures the selvages being perfect.

The flexible bend is provided with arrangement supplied for grinding off an inclined frame, or the usual well-known method may be applied. This latter system has been well tested, and the method of grinding the flats from their working surfaces ensures the height of each wire on every flat being the same, whatever the wear either on the flat or wire.

The doffer pedestal carries the grinding and stripping brackets, so that any adjustment of the doffer takes the bracket with it, obviating the possibility of disarrangement, and rendering it impossible to get the grinding roller out of line with the



IMPROVED COTTON CARD
Built by John Hetherington & Son, Limited.

five setting points in the new machine an increase of two over the older machine of the same makers. These have been supplied more to meet the usual arrangement and practice in such a case than because an increase is at all necessary, for the flexible bends are ground to the cylinder by milling cutters which, fixed on the cylinder, pass over the bends from one end to the other, milling them from and concentric to the cylinder. The flats are 108 in number, but the machine is so arranged that up to 112 may be used if desired.

The card is adaptable for two methods of grinding. There is a new doffer and to grind hollow. The ends of the flats are so designed that the pressure of the chain is brought directly over the flexibles.

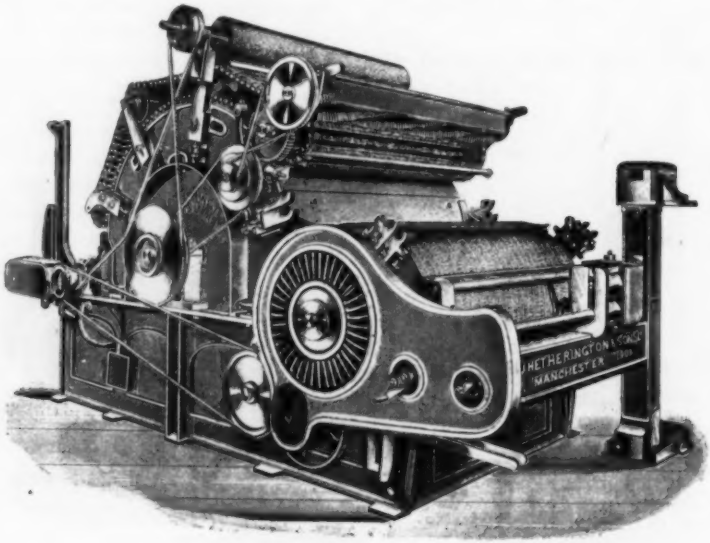
The taker-in and doffer are driven by rope gearing, which, being in one band, prevents much of the slipping which is present when separate ropes or belts are used. The one-band method also obviates any risk of the doffer stopping before or starting after the cylinder has got up speed. Such an arrangement also makes it unnecessary for the operative to have to help the fleece through the trumpet to prevent the sliver breaking each time the card is started. This sys-

tem of continuous rope driving also saves a few inches in the total width of the machine.

The form of the lap-stand behind the machine has been slightly altered, and by the new arrangement it is possible to put on two full laps without them coming into contact with one another. The division plate and feed plates have been modified, and in their new form present a notable improvement. They are arranged so that no good fibre can be thrown down, and so that the short fly is kept separate from and cannot become intermixed with the heavier dirt below the taker-in. A stiff mote knife of double steel is used, supplied with a setting arrangement which allows the knives to be easily and accurately adjusted closely to the taker-in. The comb box is also made strong enough to prevent any vibration.

The doffer cover, as before, is of polished steel, but it has been slightly altered. The edge of the cover is made so as to form a smooth piece, perfectly filling up the space between the bend and the doffer. This makes it impossible for dirt or loose fly to get down on to the doffer. Other improvements have been adopted—in fact, the machine has been thoroughly revised throughout, and can justly be called a new type of carding engine. There is an automatic system of weighting the feed rollers, which is self-adjusting and prevents snatching; a double-speed motion for the doffer, and numerous other features.

The guarding of the machine is an item which has been carried out in full. Every moving part and toothed wheel is covered in a complete manner, making accidents practically impossible. One noticeable addition in this respect is a method of locking the front cylinder cover. It is so arranged that it is impossible to open this cover when the machine is running, and impossible to start the machine with the cover open. This guard is also made to work automatically, so that the same movements which stop the card open the cover, and vice versa. One of these cards is now on exhibition at the company's works in England, and further particulars can be obtained at the Boston agency.



IMPROVED COTTON CARD
Built by John Hetherington & Son, Limited.

Storage of Oil.

It requires no effort to convince manufacturers of the desirability of having some convenient receptacle for the storage of oil used in the mill. Without such a means of storage, a great waste results, and the floor receives a large quantity of the oil which is intended for the bearings of the machinery.

The Wiley Safety Oil Cabinet, shown in the accompanying illustration, has been used in our mills for many years. The manufacturers state that there are now over 75,000 of them in use. They are constructed of matched lumber of good quality, bound with bands. The sides are lined with zinc and a device is provided for preventing evaporation. The oil is drawn and measured in the sink, and any dropping runs back into the cabinet without loss. A gauge rod is provided, by which the oil poured into the tank can be accurately measured. This is a useful means of detecting any shortage. The danger from fire is greatly lessened by the use of a well constructed cabinet; the wood case and zinc lining of the Wiley cabinet being both non-conductors of heat prevent gas from being generated in case of fire, so that the danger from explosion is greatly reduced.

The cabinets are well built, and will last for a long time. The oil can be syphoned or poured from the barrel into the tank, saving the labor of pumping. The manufacturers warrant their cabinets for ten years, and are so confident of their merit that they are ready to refund the money for the cabinets that do not give satisfaction after a trial.

Further information may be obtained from the New York Oil Cabinet Company, 180-186 Cherry Street, New York, N. Y.

—A head without a memory is a fort without a garrison.—Napoleon.

Filtration of Water.

The purification of water for manufacturing purposes is becoming a subject of increasing importance from year to year. Pure water is not only a necessity in the manufacture of paper, but also in the bleaching and dyeing of textile goods, as well as many other industries, and where large quantities of sediment is contained in the water used in steam boilers, filtration will add much to prevent scale and prolong the life of the boiler, and effect a saving of fuel. Frequently manufacturers are forced to take their supply of water from the town system, on account of the pollution of the streams.

The Norwood Engineering Company, Florence, Mass., manufacture the Wilson filter for purifying water for industrial and household purposes. The advantages claimed for this filter are: (1) A valve at the bottom of the bed that admits the use of very fine filtrating material, without danger of particles passing through into the filtered water. The area of the waterway through the valve is so large that it will permit of an abundant supply of water, that the whole filter bed will be lifted, separated and thoroughly washed. (2) A controlling valve for reversing the water through the filter, which avoids the necessity common to many systems, of opening and closing several valves to accomplish this object, an operation which involves the liability of getting polluted water into the filtered water. (3) The ability to use very fine filtering material, thus obtaining a superior quality of filtered water, without the use of a coagulant, except in extreme cases. (4) A device for supplying, when required, a coagulant in proper quantities; the supply of the coagulant is shut off as the water supply ceases.

The Norwood Engineering Company have spent many years in the improvement of their filtering apparatus, and are ready not only to install plants of any capacity, but guarantee results. They refer interested parties to a long list of users of their filters, and would be pleased to furnish any further information.

—The value of textiles exported from Bradford to America for first quarter of current year are reported at $1,216,472, which is less than for any similar period during past ten years. This is all the more noteworthy as the imports from Bradford to the United States were restricted to very small proportions just preceding the Wilson tariff, and while the high McKinley rates were still in force.

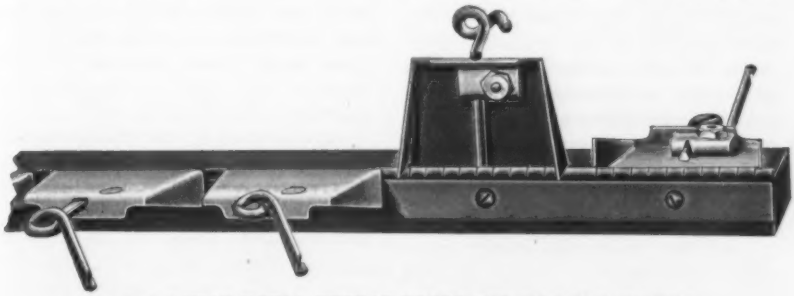
—A machine for forcing water or air through fabrics wound on a perforated cylinder, has been patented in Germany. The cylinder is set in a tub, and both are connected with a pump in such a way that a stream of water may be forced through the goods in either direction. The cylinder is also connected with an air pump by means of which the water can be forced from the cylinder, and the goods cooled by an air-blast.

A German process for dyeing alizarine red on cotton has recently been patented. The formula for 77 lbs. cotton is as follows: 10 lbs. of 25 per cent. Alizarine red is dissolved in about 250 gallons of water; ½ lb. calcined soda, 2 lbs. saccharate of lime and ¼ lb. tannin is added. After dyeing the cotton in this bath, the material is steamed for one or two hours at a pressure of one to one and one half atmospheres.

The Houghton Thread Board for Cotton Spinning Frames and Twisters.

The adjustments and care of the yarn guides on spinning frames and twisters has always been a source of trouble to manufacturers. Many attempts have been made to remedy these difficulties, but up to the present time have not been accompanied with much success.

The thread guides are made of hardened material, which are guaranteed not to break, and will not groove and cut the yarn. The manufacturers state that the guides are as desirable as porcelain eyes. The drops are made from sheet steel, and there are no projecting hinges to interfere with cleaning the machine, while its hand some appearance and the ease of cleaning is an incentive to the spinner



THE HOUGHTON METAL THREAD BOARD FOR SPINNING FRAMES.

A device has been invented by L. T. Houghton of Worcester, Mass., which has been subjected to practical tests, and is now offered to manufacturers with confidence on the part of the makers, that it at last solves the problem of providing spinning frames and twisters with a thread board that can be easily cleaned, in which the guide eyes can be adjusted quickly, and which is not liable to become disarranged. The device is so simple, that an inspection of the illustration will show the reader the principle upon which it is constructed. By loosening the nut shown in the illustration, the guide eyes can be moved out or in over a space of one inch, and when brought to the proper position are fastened by tightening the lock-knot. This adjustment can be made, if desired, while the frame is in operation. The thread boards are made in sections 33 inches long, each having eleven or twelve boards, according to the gauge of the frame, interlocking with a strip 33 inches long; this acts as an angle iron when fastened to the thread board rail, preventing sagging or springing between the points of support. The device is easily applied. to keep it clean. Further information concerning this device can be obtained from the manufacturers, L. T. Houghton & Sons, Worcester, Mass.

The Ring Frame Spindle.

The development of the ring frame for cotton spinning is really a history of the successive improvements of the spindle. Before the invention with which the names of Sawyer and Rabbeth are so closely identified, the limit of spindle speed was between 4,000 and 5,000 revolutions per minute. Above that speed it was impracticable to operate the spindle, owing to the jar and vibration, which soon rendered the working parts useless. By the aid of many improvements, the spindle itself is now capable of being run at a speed far in excess of the capacity of the other parts of the frame.

The highest practicable speed for the spindle at the present time is about 9,500 revolutions per minute. Above this, two principal difficulties are encountered; one is met with in the spinning of fine yarn, when the friction of the traveler at higher speeds than 9,500 is so great as to

cause a strain that breaks the thread; the other difficulty is met with in the spinning of coarse yarn. Here the thread is strong enough to stand the strain caused by the friction of the rapidly revolving traveler and the ring, but as coarse yarn requires a much less number of turns of twist per inch, it is found impossible for the operator to make splicings, owing to the coarse yarn catching the twist so quickly as to twist off during the operation.

The Belanger device for "spinning in the air," as it is sometimes called, remedies the difficulty met with on fine yarn, by utilizing the friction of the traveler to revolve a rotary ring, which is so constructed as to balance itself like a top, forming an air cushion between itself and the stationary holder or washer on which it runs, thus preventing frictional contact of parts.

About a year ago we published a description of this spindle which seemed to have great possibilities.

We have recently examined it again in operation, and have been very favorably impressed with its work. It was running on No. 34 cotton, front rollers running at about 140 revolutions per minute, and the spindles, it was stated, at 12,600 revolutions per minute. There was no heating of the parts perceptible, and no more than the usual breakage of ends. The yarn was wound very hard on the bobbin, and this is claimed as a distinctive advantage of this spindle, enabling a bobbin to hold more yarn, and reducing the time required for doffing.

We inspected the work of this spindle where a very small bobbin had been used; the results pointed very strongly to the possibility of spinning on the cop or bare spindle.

Splicing can be done very easily, and at a high speed, on account of the possibility of the yarn being unwound from the spindle while the latter is running, and while the yarn is threaded through the traveler. This may seem impossible at first thought, but it is explained by the fact that the rotary ring revolves at a speed corresponding with that of the spindle itself, and at the same time requires a momentum which renders its movement temporarily, at least, independent of the spindle and traveler, which started it in motion. Under these conditions, the operator can draw sufficient yarn from the spindle with one quick movement of the hand, and make splicings before the high speed spindle can introduce sufficient twist to break the end.

—Encouraged by the high prices for cotton which have prevailed during the past year, the planters throughout the South are preparing for an immense acreage during the coming season. The North Carolina Commissioner of Agriculture sounds a warning against this policy. He says:

"Judging from the heavy movement of fertilizers, it is the evident purpose of the farmers to plant very large crops. With a favorable season, if the yield is in proportion to the acreage, I greatly fear that the farmers will have cause to regret the making of so large a crop. I fear we shall see 5-cent cotton again."

—To make an alloy which expands in cooling, melt together nine pounds of lead, two pounds of antimony, and one pound bismuth. This alloy may be used in fastening foundation bolts for machinery into foundation stones. Collars or heads are left on the bolts, and after the hole is drilled in the stone, a couple of short, small holes are drilled at an angle to the big hole. When the metal is poured, it will flow around the bolts and also into these small holes, and it is nearly impossible for the bolt to pull out. When drilling holes in stone, the water used should be carefully dried out by the use of red hot iron rods, before the melted metal is poured in, in order to prevent accident by the blowing out of the metal and burning the hands and face of the workman.

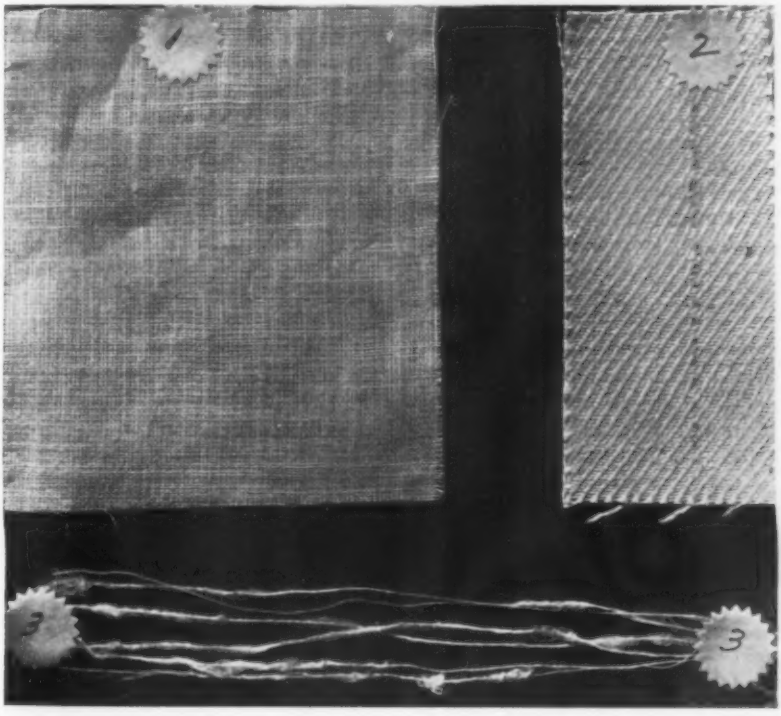
COTTON DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Imperfections in Weaving.

ARTHUR DYSON.

There are so many different causes for the imperfections in cloth, and at the same time so many things which may be suggested for their correction that it is a subject which interests many different workers in our mills. A few remarks in this connection may make the persons responsible for the defects a little more careful about allowing such imperfections to appear in the cloth when woven.



In this article it is proposed to take up a few of the imperfections which are caused by conditions which the weaver cannot control, and for the avoidance of which the weave room overseer must depend a great deal upon the faithfulness of his employees and their ability, or willingness to remove such defect; no matter what the cause, or where it originated, the weave-room must be held responsible for all damaged cloth; the closer the standard as set by the superintendent, and the weavers' ability to measure up to this standard, the better chance has the cloth in the market.

This may seem to work against the weave room; but the persons in charge must be continually on the lookout for anything which will tend to injure

the fabric woven, and be ready to appiy the remedy, either directly, (if the cause is in the weave room), or by calling the attention of those responsible for the bad work, and insist upon its being remedied; proper attention to these matters, will depend much as to whether imperfections like the one shown in figure 12, are found in the cloth or not.

This is an imperfection in the warp yarn, and while not of a serious nature, they detract from the value of the cloth, and should not be allowed in the yarn. In figure 1 the cotton has been poorly carded, and the result is shown by the neps and seedy appearance of the piece, not only making the cloth look bad, but also tending to weaken the yarn, and thus cause more or less breakage of the warp threads.

Given a fair grade of cotton, with the latest type of cards, this imperfection should not exist, and even on the old style of cards they can be so nearly eliminated as to be entirely unnoticed. Of course, the card must be in good condition, and the different parts properly set; the "mote-knife" being placed so as to knock off the seeds and dirt, and the flats set at a proper distance from the cylinder; the screens must be openly adjusted to the cylinders.

I examined a card screen the other day, which was set for a fairly fine grade of cotton, and where it should have been set from 8/1000 to 10/1000, it was fully twice that distance; yet the "carder" though that he had his machine all right. Another important point which many of our carders should be more careful about, is the setting of their tops, setting them according to the cotton being used, and changing the settings when a change is made.

At No. 2 we get an illustration of a common imperfection in many of our mills, and one which causes more annoyance and worry in the weave room than any other one thing, with the possible exception of knots. At No. 3 we have another illustration of No. 2; in this case the bad yarn has been removed from the warp (40s) by the weave ,and can be more plainly seen. The loss of time occasioned to the weaver in removing these lumps and bunches, and the thick and thin places in the yarn is a great drawback to a large production of cloth; very often these faulty places in the yarn are woven in the cloth, and the result is an imperfection in the appearance of the cloth, as seen in No. 2. The yarn seen in No. 3 was taken from a warp from which cloth for window shades was being woven; any one can imagine the look of the shades when placed in position at a window; providing the uneven yarn had been allowed to remain. These imperfections must be carefully removed from such goods as are used to make umbrellas, parasols, etc.

The only thing for the overseer of the weave room to do, is to insist upon his weavers removing the objectionable threads, at the same time calling the attention of the spinning room overseer to the matter. Clearer waste, etc., should be kept apart from the yarn, and the spinning rolls should be kept in good condition; it is poor economy which keeps down the expenses of roll covering, at the cost of poorly twisted yarn. Another point which tends to produce these bunches, is the fact that very often the employee on the drawing frame, when piecing up roping, will make a hard twisted joint, thus producing the bunch.

Another place where bunches are often caused, is the warping room; very often we find the stop motion, rolls, and their parts of the machine covered with dirt and cotton; this gradually accumulates until it adheres to the yarn, and causes a lumpy thread. Each warper tender should be provided with a long rod with one end covered with flannel, and be compelled to clean the dust from beneath the sheet of yarn, as often as it begins to gather.

(To be continued)

Overseers and Overseeing.

CHARLES W. DENNETT,
North Adams, Mass.

(Abstract of a paper read at the meeting of the New England Cotton Manufacturers' Association, April 24, 25, 1901.)

It is the overseerial or managerial talent first displayed by the overseer in the narrow limits of one department, strengthened and developed by training and experience, that leads to success in its larger exercise in the office of superintendent or general manager. There are many men of great executive ability who are successful in the higher place without passing through the lower grades, but there are few who would not have been better prepared for their positions by early training in the duties of overseer. As a rule, the competent and practical managers of our various industries must be sought among those who have served their apprenticeship and proved their capacity in the overseer's office. It will be seen therefore, that the "overseer" topic is an important one to all manufacturing industries, and especially so in that of cotton manufacturing.

What are the distinguishing qualifications and characteristics of an ideal overseer?

First, he must be a man: a man of character, clean, straightforward, upright. This is a fundamental requirement; it is the foundation upon which the whole superstructure must rest. The most skillful builder cannot make a sound structure out of rotten timber. Neither education, opportunity nor training can transform a deficient man into a sufficient overseer. Owners and managers are under obligations to their communities to see that their overseers are good citizens and fit men to exercise control over large bodies of help, many of whom are women and children. This is good business as well as good morals, and it pays in the long run.

Second. He should have a good knowledge of the work which he directs. Men are often successful in directing work although ignorant of the technical processes, but it is always better to have a thorough knowledge of them.

Third. He should be courageous, industrious, and alert both mentally and physically. Mental slothfulness is one of the greatest dangers, especially to a man who has attained a reputation as a good overseer. Timidity in handling the help is a source of more trouble than is generally supposed.

Fourth. He should have the managerial instinct or capacity. This is the most important of all the qualifications except the first. Without it all other attainments shrink in value or become wholly useless. It is a natural gift, consequently it is paramount to all mere acquirements. Our fathers called it "gumption;" our New England mothers when speaking of it as applied to housekeepers used the word "faculty." Referring to the incompetent housewife, they said she had no "faculty" for managing or planning her work. Whether it be called executive or managerial ability, gumption or faculty, it is a possession of priceless value, and those most highly endowed with it become our kings of industry. It may not be acquired or imparted, but like all natural gifts it may be trained and developed to a high state of efficiency. Hon. N. W. Farwell, for whom I worked when a young man, told me that he got his first ideas about managing from a New Hampshire deacon for whom he worked when a boy. He said the deacon always managed to have a load both ways. Anyone who ever worked for Mr. Farwell will not question that he possessed the natural ability to profit by this early suggestion.

Fifth. He should be thoroughly loyal to his employers. Character, technical training, courage, diligence, executive ability, loyalty. These I regard as the principal qualifications of the ideal overseer.

Shadows are needed in bringing out a picture. In trying to paint a portrait of the ideal overseer perhaps a few types of the opposite kind may help to give it life.

TYPES OF INEFFICIENT OVERSEERS.

The first I will call the automatic. I once heard a sermon by a good Methodist preacher, in which he gave the concepts of various schools of thought relative to the attitude of the Deity toward the universe he had created. "One school," he said, "teaches that the Almighty started everything all right and then had nothing more to do with it, but just turned his back on it and let 'er whiz." This is the way the automatic overseer runs his room, or tries to run it. He places his men, issues his orders, makes a lot of rules, gets what he calls his "system" in operation and then turns his back on it and "lets 'er whiz." He has no knowledge of the details of his work, except what comes to him through subordinates, those nearest him who catch on to his system and imitate their chief. The result is that important operations are left to careless workmen, and the work tumbles along instead of being directed. Law won't execute itself in a cotton mill any better than elsewhere, and the overseer who doesn't look for himself to see that his orders are obeyed is a failure.

The timid type. If the North American Indians operated cotton mills, some overseers would receive the sobriquet of Old-Man-Afraid-Of-His-Help. Lax discipline, poor production, bad quality and high cost are the earmarks of this type. He is afraid if he enforces obedience to orders he will lose his help; he is afraid if he is short of help the superintendent will be down on him. He dare not take responsibility. If a regulation is to be enforced to which his workmen object, he shifts the burden to his superiors. He says, "I can't help it. The superintendent made the rule," and he implies that if he had the authority he wouldn't do it. The help see through him and work on his weakness. He is always in hot water; they do not respect him and the manager's hair grows gray in the wearisome effort to hold him up. He simply has to be endured; he cannot be cured.

The lazy type. How he got his position I do not know. Perhaps through favoritism, or because he was a good fellow, or possibly in early manhood "about the opening of the bud" he made a supreme effort and succeeded in getting the place which he longed for. He wanted it not merely for the increased pay, but because he imagined if he got an overseer's position he could rest. His deficiencies are too numerous to be catalogued. He looks at everything from the point of view of his besetting fault. Ask his advice about some change or improvement; you do not get a disinterested answer. If it will make it easier for him he will favor it; if not, he is opposed. He is a weak spot in an organization where ceaseless industry and vigilance are necessary to compel success.

The crooked type. He is a combination of the lazy and the timid, with an essentially dishonest make-up for a foundation. He will neglect his work and lie about it. Bad work he saddles on some other department. You find it difficult to enforce a regulation in his room. He talks fair to you about it and secretly opposes it. When I was superintendent I once had such a man in my employ. The agent made a regulation forbidding the bringing of breakfasts into the mill after starting time. I found great difficulty in enforcing the rule in his department. By watching carefully I discovered that he was systematically violating the rule by having his own breakfast brought in by a back door to which he had the key. At the same time he professed to be doing all possible to enforce the rule.

The crooked overseer will falsify his reports to lower his costs and give men time which they do not work, and thus indirectly increase their pay.

He talks against the mill and the management when he thinks he can do so with safety. Discontent and strikes originate in his department. He is a menace to any organization and should be kicked out without ceremony.

But enough of the shadows. The foregoing naturally suggests the question, Why are inefficient or incompetent men tolerated? The answer is ready. It is because competent and efficient men cannot always be found. I think the majority of managers of middle age will agree that there is not as much good material for overseers is the mills today as there was twenty years ago.

For some reason our young men of education prefer to try law or medicine or some so-called genteel vocation rather than the mill, and yet an assured income of from one thousand to fifteen hundred dollars per year for a service of fifty-eight or sixty hours per week, with the average opportunity of advancement, is preferable to the work and compensation of fifty per cent. of the lawyers and doctors. Many are looking to the textile schools to remedy the deficiency and they will no doubt render valuable aid in this direction, but as we have seen, technical knowledge is only one item in the equipment of an overseer. Nothing can take the place of natural fitness supplemented by actual experience in the mill. Men in charge know that a much larger per cent. of faults and failures in a cotton mill is chargeable to lack of attention and management than to the lack of technical information.

I believe as one method of providing more material for overseers we should encourage boy graduates of our high schools to go into the mill and work, and if they are interested, urge them to go to the textile school and give them a place when they graduate. But I will leave the further discussion of this important question to the Association and will close with a word about the treatment of overseers.

I believe in giving overseers a vacation without loss of pay and holding them responsible for results in their department just as if they were there. If a room is not organized so that it will run a week or ten days without the boss, there is something wrong and it is well to be aware of it.

I think an overseer should have perfect freedom to discharge all the duties pertaining to good citizenship. He should not be debarred from holding office, especially unsalaried offices where no special draft is made on his time during working hours.

Production and Cost in Cotton Mills.

Editor Textile World:

I have been much interested in the article in the February issue, relating to the cotton industry in Austria, and have made some comparisons between the opinions given by the Austrian correspondent and my own experience, which may interest your readers.

The first question relates to the weekly (66 hours) production of a 10,000 spindle mill, producing No. 20s cotton yarn. My observation leads me to the conclusion that two pounds, or 40 hanks per spindle per week of 66 hours is a fair production on No. 20s yarn. This would give 20,000 pounds per week, for the 10,000 spindle mill; this production can be obtained with good help and modern machinery. On hosiery yarn or filling two per cent. more might be secured, but on extra hard twisted warp there would be a reduction from this amount of probably 2,000 pounds per week. Any attempt to increase the production above these figures would certainly result in making much more waste, which is a very important item in the cost of manufacturing, so that the supposed lessening of the cost of production by securing more pounds per week would be more than offset by the cost of the material which is made into waste.

The weekly production is calculated by the following method: 20,000

pounds of No. 20 yarn is equal to 400,000 hanks, or 336,000,000 yards, which is equal to 12,096,000,000 inches, or 3,054,545 inches per minute.

One drawing of the mule measures 64 inches. To this is added the roller motion (4 inches), making 68 inches, and from this we calculate that there will be 44,920 draws per minute, or 4.49 draws per minute for each spindle or mule.

This is a fairly high rate of speed, and besides this, the time consumed in cleaning and doffing and from various other causes, which would amount to at least 12 per cent. This would necessitate the machine being speeded up to give 4.88 draws per minute during actual running time or nearly 5 draws per minute. This, of course, can be done, but the man that tries it will "come out at the little end of the horn." The machinery and quality of the work will be ruined.

In regard to the amount of waste made in manufacturing, I should say that twelve per cent. would be a fair allowance on good American middling cotton.

LAKEWOOD.

A Ring Spinning Frame for Coarse Yarns.

A machine builder in Alsace has recently exhibited a ring spinning machine in operation which possesses some new features illustrated by the accompanying drawings, and is said to be capable of spinning on the bare spindle.

The front rolls, as shown in Fig. 1, are so arranged that a line from centre to centre forms an angle of about 45° with the spindle. By this arrangement the twist runs into the yarn up to the point of contact between the rollers, thus avoiding having the roving resting on the lower roller for a short distance.

Under the front rolls a brass wire (E) is stretched to catch broken threads, and prevents their winding around the rollers. Below this wire a plate (B) is placed, having a slit lengthways, and an angle plate (D) fastened at the back. The yarn passes through the slit, and it is claimed that flyings are in this way removed from the yarn. The flyings can be cleaned easily from the back of this rail.

In order to prevent variation in the twist caused by slipping of the bands,

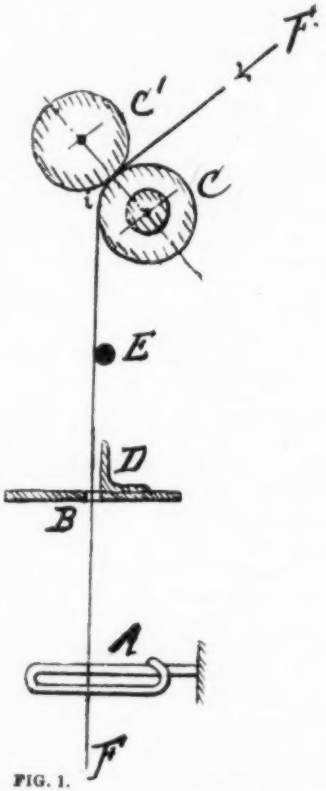


FIG. 1.

a double whurl (WW), Fig. 2, is used. The builders claim this as an especial advantage on soft twisted filling yarn where a slight variation in the twist makes a considerable difference in the strength and appearance of the yarn.

To reduce the strain on the yarn caused by the ordinary ring traveler, a ring and traveler shown at Fig. 3 is employed. A traveler (L) is set between an upper ring (R) and a lower

one (R'). The pull of the yarn brings the eye (L') of the traveler close to the yarn on the bobbin, and keeps it at the same distance from the bobbin during the traverse of the ring rail. It is claimed that in this way the winding is effected in a manner similar to the winding on flyer frames, and much strain is taken from the yarn.

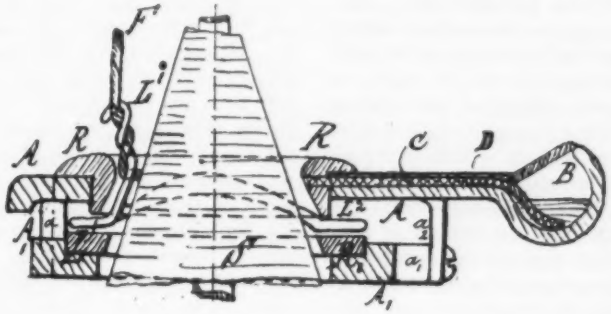


FIG. 3.

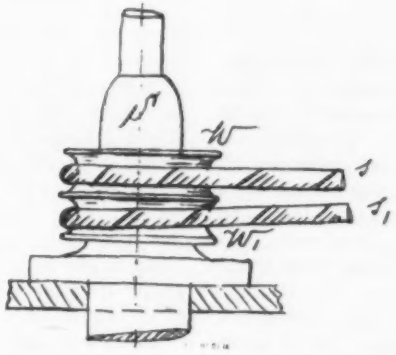


FIG. 2.

These new travelers are made for rings from 1⅛ inches to 2¾ inches diameter, and with the same size ring, are made of wire varying from No. 1 to No. 16 according to the size of yarn spun.

A device for keeping the rings oiled is shown in Fig. 3; (B) is a trough filled with oil which is slowly carried by the wick (C) to the ring (R), where it keeps the surface lubricated.

The machine exhibited was fitted with 1¼ inch and 2¾ inch rings. With the larger ring about a No. 5 was spun; the spindle revolved 2000 revolutions per minute with 155 revolutions of the front roll. The production was about 3 ozs. yarn per spindle per hour; one hand tended 200 spindles, and the machine handled roving made from short cotton waste.

The spindles with 1¼ inch rings were run 5500 revolutions per minute spinning No. 18 yarn; the front rolls, which were 20 millimetres in diameter, ran 165 revolutions per minute; this gives about 14¼ turns of twist per inch, and a gross production of about 1 1/10 ozs. per spindle per hour. One hand tended 400 spindles.

The bobbin used was straight, and well adapted for unwinding the yarn. The yarn was wound very hard, and two bobbins held as much yarn as

three of the ordinary kind. The Ost. Wollen and Leinen Industrie states that judging by these results, which show an increase in production of at least 30 per cent., the new machine is well calculated to compete with the self actor on these coarse numbers and this kind of stock.

Points in Sizing Cotton Warps.

In a weaving mill, there is no more important process than sizing, and on its satisfactory management depends the quality and quantity of work. In many cases, especially for foreign trade, success has come to the mills, which have been up to date in the sizing of the warps, and failure resulted where the sizing was neglected. This is exemplified by the anxiety of manufacturers to acquire the best recipes or the best preparations obtainable for giving superior results.

The sale of goods from a print cloth to a heavily sized calico depends largely on the quality of the goods and on the way in which the warps are sized. The cost of making cotton cloth varies according to production, which is influenced to a large extent by the character of the size. The difference between good and poor sizing is very similar to the difference between a mill having antiquated machinery and one having modern machinery. In both cases production and quality suffer.

Cotton warps will not weave well without previous application of some strengthening substance. The threads in the looms are under strong tension, and while in that condition are liable to be chafed. The harnesses and the reed rub the threads so hard as to fray or wear them away, unless they are well sized. Great care is necessary in the making of sizing compounds, as no compound is adapted to all classes of goods and to all conditions.

The important points as to the character of the compound required, are the class of goods, the "feel" required, and the softness or hardness of the water used. The intelligent and conscientious manufacturer of sizing compounds will require a full explanation in these things in order to intelligently prescribe the right size.

After selecting the most suitable compounds, and getting the best neutral starch (or flour when necessary), it is important to use proper or sufficient quantities, and find the formula best suited for any particular class of goods. The closer the weave, the finer and stronger the size must be. Mixing the size is very important. Experienced men state that the best way is to mix the starch in cold water before turning on the steam. Some mills make the mistake of only partially cooking their starch. The size must be thoroughly boiled before using, for otherwise it retains a granular nature, causing faulty cloth.

For heavy sizing such as for single yarn duck, coarse brown sheetings, drills, and the cheapest export goods which are not intended for converters, it is a good idea to insert in the size kettle an extra boiling apparatus, so arranged as to cook the size under pressure. If this is done a stronger and better size in every way is obtained, because the size is thoroughly cooked and will penetrate the yarn, giving even, clean, smooth and strong warps. Pure sizing does not require this treatment.

Again, for heavy sizing a feed pump should be attached to the size kettle, so as to keep the slasher machine well supplied with good, well-mixed sizing. For colored warps or for sizing by the chain system, it is necessary to obtain a preparation which will give a smooth, well-sized warp, and keep the threads open so that they will divide easily when beaming, as well as in weaving. If the right compound is not used, sizing warps by the chain system proves very costly, and especially so if the threads stick together as they are very apt to do. All managers of mills on colored goods know of this difficulty, which, however, is easily overcome by using the right preparations.

PARKINSON.

Improved Spinning Frame.

Built by Howard & Bullough American Machine Co., Ltd., Pawtucket, R. I.

Before introducing these frames on the market the builders made a careful study of other machines for the purpose of embodying their advantages in this new frame and avoiding the disadvantages. This, they believe, has been accomplished, and additional improvements have been made, which will be of great advantage to the manufacturer and spinner.

All the different parts of the machine are turned, milled or planed, and wherever two working parts come together they are tongued and grooved. All parts are made by special tools and are exact duplicates and interchangeable.

The creels are constructed with double creel supporting rods, so as to ensure the creel being rigid and free from vibration, thus preventing the stretching of roving.

All gearing is placed at one end of the frame, thus reducing to the lowest point the labor of making changes. Particular care has been taken in designing this gearing to have only small gears as drivers, thus ensuring easy running and an economy of power. All gears are securely boxed, protecting the operatives from any possibility of accidents. The gears are extremely convenient to get at, and so arranged that a wide variation of draft and twist is easily secured.

The spindle rails are of the box pattern, specially heavy and designed to do away with any liability of springing or twisting.

In the taking-up motion only one gear is used, thus doing away with the changing of ratchet or taking-up gears. The stop is set to whatever number of teeth are to be taken up, according to the different sizes of yarn.

The frames are built very low, so that they may be tended by small help. At the same time the machine is particularly heavy in all of its principal parts, and is designed and so constructed as to stand the high speeds of today without vibration, thus preserving the spindles, ensuring light running, and reducing the cost of repairs.

The cylinders are all made from specially heavy block tin. The shafts of same are of steel, provided with Woodruff keys. All cylinders are thoroughly tested before leaving the shop. The bearings are of phosphor bronze and are of the self-oiling type, thus ensuring perfect lubrication. Outriggers for supporting the driving pulleys can be applied to either head or foot end of frame as may be specified.

Three different heights between the thread wire and the point of spindle can be obtained by our new thread board device. Either Walmsley or Sharples thread board lifting motion will be applied when so specified.

For releveling the frame a device is applied which renders any carpenter work unnecessary. The foot of each samson or spring piece is provided with a shoe and jack screw by which they can be raised or lowered to meet any unevenness in the floor.

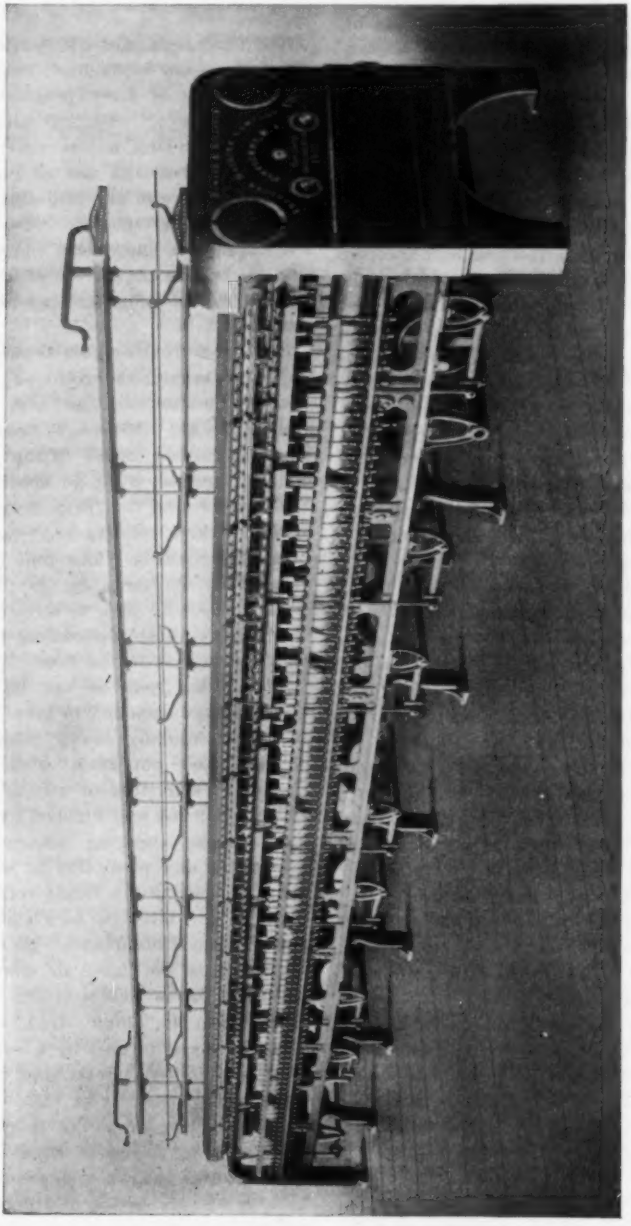
The lifting rods do not have any foot castings attached to them. They can therefore be easily taken out, cleaned, and put back without the trouble of adjusting or setting. These rods are turned and finished by a special process, ensuring accuracy and preventing any possibility of sticking.

All of the bottom fluted rollers are made in the builders' own shop from the best stock obtainable. Every possible means are used to ensure accuracy in these rollers. The change from warp to filling wind, or vice versa, is accomplished by a very simple method, little work, and without loosening a set screw or bolt.

A foot lever or brake is provided for doffing by means of which the operator causes the rail to descend to the bottom, and the action of dropping the rail winds back the rack, thus doing away with any liability of damage to the bobbins through the help forgetting to wind back the rack. By this

same arrangement the operator may check the rail at will in any position of the wind or traverse. These frames

made of cast iron. In this spindle are riveted steel fingers which carry the cap bar nebs. These fingers are made



IMPROVED SPINNING FRAME.
Built by Howard & Bullough American Machine Co.

are equipped with any pattern of modern spindle desired.

The spindle only of the cap bar is

in such a form that there can be no tilting of the nebs. The cap bar nebs are milled perfectly true, thus ensur-

ing the top rollers always being parallel with the bottom fluted rollers. The cap bars are so arranged as to leave the roller necks entirely free, so that they may be kept perfectly clean without removing top rolls or cap bars.

The changing of the setting of bottom rolls may be accomplished without unweighting or disturbing the top or bottom rolls.

Iron traverse rods are applied to which are attached adjustable brass or aluminum guides.

Any of the leading makes of separators, such as Sharples, Doyle or Rhodes-Chandler, will be supplied as specified.

Common or Speakman patent lever screws will be supplied as required.

Some of the Troubles to Manufacturers Arising from Dyed Yarns.

FARQUHARSON J. MUIR,
Milltown, New Brunswick.

(Abstract of a paper read at the meeting of the New England Cotton Manufacturers' Association, April 24, 25, 1901.)

There are various methods or systems of yarn dyeing, which require different preparations for the handling of the yarn in the dyehouse, as for instance,

(A) Skein dyeing, which involves reeling, kier boiling, vat or hand dyeing, hot room drying and skein winding.

(B) Scotch system or long chain dyeing, which requires chain warping or balling machinery, boiling, dyeing, drying by can or hot air, and beaming.

(C) Bradford system, which in principle is like the Scotch but is used mostly for short chains, the main difference being in the tub having three compartments.

(D) Then there is raw cotton dyeing, which has been developed largely in the last few years, on account of the vast progress made in producing good one dip dyes, and where these can be used, a great saving is made over yarn dyeing, as the number of operations is reduced.

(E) Again we have piece goods dyeing, or dyeing of the manufactured product, either in jiggers or compartment boxes.

Each of these, as the saying is, has "troubles of its own," but the subject is very extensive and we will confine ourselves in this paper, to some of the troubles arising from long chain dyeing.

THE SHADING OR MATCHING OF COLORS.

One of the most difficult problems manufacturers of yarn dyed goods have to solve, is to have piece after piece of cloth of the same pattern, come out, to all intents and purposes, of uniform shade, and principally for the reason that the long chain system affects this, has it come into favor. By it, in most cases, all the separate colors forming the pattern, can be dyed at one time, and the filling, even if solid, can be dyed in one set, as from 400 to about 600 or 700 pounds can be dyed together.

With your foreman dyer rests the responsibility of matching the shades, but such a combination of elements enters into even one shade, that sometimes his is a most arduous task, for you will often find that a certain shade has been dyed satisfactorily for seven or eight times, then without any apparent cause, the shade will get off. Now, were all the ingredients that go to make up a specific shade, chemically pure and uniformly manufactured, and were you to use pure H_2O, and have your cotton all one shade, then the dyer would be at fault and might be justly blamed, but it is impossible to procure in commerce, all of these things, nor is it practical to test chemically, every dyestuff and drug that your dyer uses, and return those in which a variation is found. Most colors require what your dyer calls a bottom, viz., tannin, usually in the form of sumac, then he fastens the tannin with, say tartar emetic, washes off the free acid, and then puts on his color. Now, as we said before, he may have dyed the same shade, seven or eight times, and had them all match, but the next time his

color gets off, and he may find that a new barrel of some drug has been opened, or if he gets his water for dyeing from a river, it may be the water if analyzed, would show an increase of lime, and he has now got to patch up the color to get it to shade. This almost in every case, requires the adding of some dye not used in the former shade.

Then, too, the drying or sizing of the yarn may affect it differently, so that the colors in the finished goods, fail to match the original. And let us say, the skill of your dyer will be best shown in such cases, as the most difficult part of this trade is to "doctor a shade."

HOT PIPE MATCHING.

Another cause for non-uniformity of shade is met with in matching and drying a sample on a hot pipe. The drying of the bulk on dry cans or hot air dryer, often gives a different cast and it is the practice of most dyers to match his shades a second time after the chains have been dryed and aired.

The standard shades by which the various colors are matched, should have systematic care bestowed on them, as they will fade, and become dirty by handling, and if your standard changes, how can you hope to keep a uniform shade in your goods. Many mills make it a practice to have all standard shades emanate from the designing room, as the sample of cloth made by the designer, is the accepted pattern. The shades are taken from the same yarns as in the sample, and given to the dyer and beamer, and the latter is instructed to match every chain before beaming, as should an off shade, by carelessness or any other cause, get into the beaming room, it may yet be saved and touched up if caught before being put on the beam.

SLASHER CHANGE.

Again, you are liable on your slasher, to meet with another element of change in shade, for should the size be on the acid side, you will find it will affect many colors, especially those made from an alkaline basis. It is very essential therefore that the overseer of your dress room, should be supplied with litmus so he can keep his size neutral. If the goods are finished after weaving, the same care must be used there as in the dress room.

BLEEDING ON SLASHER.

This is a source of great trouble to many an overseer of dressing, and can be greatly remedied if not altogether eliminated by the dyer having an intelligent knowledge of the composition of each pattern, that is, he should have a list sent him showing which colors go together to make up each and every pattern. In this age of keen competition, it is the constant aim of every overseer to run his department with the strictest economy. Should he therefore not know which colors are run together on the slasher, he may be tempted to cheapen some one of them, by making it less fast, thereby wrecking the whole pattern. This is a common case in black, which will bleed into the white and destroy the brilliancy of the pattern when finished. The slasherman may again, obviate some of this by a careful study of the acid or alkaline condition of the size. In this connection, we have known of puzzling problems arising from very simple causes, as for instance, a mill dyeing cotton in the piece with benzopurpurine (an alkaline color) had their goods all turn black at the selvages, and they spent many an anxious hour to ascertain the cause, which at last proved to be due to the wet goods after dyeing and before drying, being placed in close proximity to some acid, the fumes of which, acted upon the exposed parts and turned the red black.

LEASING TOO TIGHT.

The chains when prepared on the chain warper for the dye house, are leased to facilitate rebeaming. In the dyehouse, also, in most cases, these chains are doubled together before dyeing, and are leased by the dyer to facilitate splitting them down again

to their original size. In both these leasings care must be exercised, for if they are put in too tight, they will prevent the dyestuff from penetrating at this point, and your goods will show a white mark across them, which is very puzzling to anyone not familiar with the process of long chain dyeing.

CARELESS HANDLING IN DYEHOUSE.

Every thread broken in the warp not only requires time to repair it in the beaming room, but of necessity adds another knot to go through the harness eye and the reed, and increases the liability of hitchbacks in the cloth, or the stoppage of looms for warp repairs. Careless handling in the dyehouse will therefore react to a considerable extent on your production. The dyer usually doubles four or five chains together to reduce the length of run in dyestuff, and tangles frequently occur, which require patience and skill to unravel successfully.

Another source of trouble is the top squeeze roll on the dye tub. This is manipulated by hand leverage, and a careless workman may fail to lift the roll in time to let the end of the yarn enter. As a result, the yarn is bruised and will often fall apart when stretched on the beaming frame, and the dyer will hear the complaint that the yarn was "acid burned" in dyeing, or was made tender by chemicals used, when the real cause may often be traced to the bruising at the squeeze roll.

When splitting the warp so as to reduce the bulk to the original chains, unless intelligently done, a great many ends will be broken. You will readily see, therefore, that it is of the greatest importance, that while in the dyehouse, the yarn should be handled with the greatest care.

BITTING YARN.

As all threads broken from whatever cause, have to be pieced up in beaming, the operator must needs have spools of the same number and color as the yarn he is working on, and these colors must be constantly renewed and rematched, else you will find a solid beam streaked by threads of different shade, caused by the bitten yarn being darker or lighter as the case may be.

ELECTRICITY.

Electricity is another source of annoyance, but can be readily overcome by ageing the yarn.

SIZING OF WARPS.

The sizing of colored warps is a subject too comprehensive both in the composition of the sizes used, and in the effect of size on different colored yarns—to go deeply into, in this paper. Let us but state, that the effect of the sizing compound on grey work, is entirely different from colored work and that each color takes the size in a different degree. This is caused by the nature of the dye used, or its chemical action on the cell walls of the cotton fibres.

For example, if we have a pattern to dress, composed of dark indigo blue, a light aniline shade of blue and grey yarns, and we size these in one box on the slasher, as we would a grey warp, we will find that the light blue shade will be smooth and wiry, because the yarn being first bleached before dying, the cells of the fibre absorb a large quantity of the size. The grey yarn will have the proper amount of size necessary for good weaving, while the dark indigo blue will be soft and fuzzy and probably chafe in the harnesses and reed, because indigo being a surface dye, has already filled up the cells, and the yarn resists the size. The effect of this on the weaving will be readily understood.

These are some of the difficulties of colored work, and although we have not attempted to provide the cures for the many ills, yet we trust the mere bringing of them in detail before this meeting, may have been of interest to its members.

Weave Room.

There are very strong reasons for paying every one in the mill by a system of piece work; these advantages are many and quite familiar to all who have given the matter any attention whatever; but because a certain system of paying tends to a reduction of costs by stimulating the workers to the highest possible efforts, it does not necessarily follow that under all conditions the piece work system is the best for the mill to adopt.

There has been much difference of opinion as to the merits of paying the section hands or loom fixers by the day or by the amount of cloth woven on the section of looms under their charge. It is claimed that when a man's earnings are dependent upon the amount of cloth woven on his section, he is more likely to use both his brains and his hands to their fullest extent to keep the looms running; this is true as applied to some men, and not to others; to some the fact that they can by greater exertions on their part increase their earnings, is all sufficient to urge them on to their topmost effort; the fact that a certain amount of discredit attaches to a man whose section falls behind the production of other sections in the same room, is bound to urge any man who has much "get up and get" in his makeup on in order to show that he is as good as the best and no slouch when it comes to running a section.

One very valuable feature in the piece work system lies in the fact that it is a strong and constant check on the production of the weave room for each period, either weekly or monthly, that the pay is made up on. It is known, of course, what the looms should produce when running on certain classes of goods; at the end of the week the production may be found below the standard; then, by comparing the production of each section, it is possible to determine whether the trouble lies in certain sections, or whether the loss is general throughout the room. If the shortage is confined to one section, steps can be taken to find out just where the trouble lies; whether the section hand is to blame, whether that particular section has been blessed with an unusually large number of poor weavers, or a bad set of warps. If, however, the shortage is general, it is safe to lay the loss of production to either bad work or to slow speed.

Another advantage of the piece work system is found in a room where the number of looms cannot be divided into sections each containing an equal number; if some of the sections are stretched out a bit, it is very apt to cause more friction when the fixers are on day pay than when on piece work; in the latter case they know that their earnings will be more in proportion to the increase in their work.

In a mill where there are many styles of goods made and consequently much changing done on the looms, it is very difficult, in fact in some cases practically impossible to put a piece work system into effect that will be fair both to the mill and to the section hands; in most cases, however, a scale of allowances can be arranged that will cover the losses in production caused by the time consumed in changing. A man can do only so much, and when the attempt is made to have him do more than a fair day's work, there is bound to be a loss both by the looms having to wait more than they should for repairs and by the increased amount of repairs required to keep a given number of looms going.

I believe that the average mill can reduce its costs and improve its efficiency by adopting a proper piece work schedule for paying section hands. The rate can be based either on the number of cuts or on the number of dollars earned by the weavers.

SPINDLE.

—Art forms nearly one-half of the way that leads to perfection.—Mme. de Puysieux.

WOOLEN DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Finishing Broad Cloths.

By N. REISER.

(Translated from the German for the Textile World.)

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We will first describe the finishing of broad cloths made with a plain weave. These are generally piece-dyed goods, and are made in fine, medium, and low qualities. The warp and filling are usually made from the same quality of raw material, as one comes on the face as much as the other, and consequently, each has the same influence on the finish. The longest staple is generally selected for warp. The number of ends in the warp varies between 2800 and 3200, and the yarn is spun about 6¾ runs.

For medium goods a mixture of Australian wool and fine noils is used; the noils produce a thick, fine nap, as there are more ends of fibre exposed than with the longer staple. For these goods the warp is spun to 4¾ runs, and the filling, 5¼ runs.

For the low qualities a mixture of one-third Australian wool, one-third fine noils, and one-third shoddy is used for both warp and filling, and the yarn is spun to 3¼ runs.

As these goods require a long fulling in order to give a good felt on which to raise the nap, they must be woven quite wide in the loom, say 86 inches or even more for 6/4 goods. We will describe a few of the many methods of finishing these goods.

1. Piece dyed goods:—In some mills the goods are burled and sewed as soon as they come from the loom, but generally they are first washed, and then burled, sewed, carbonized, neutralized, dried, weighed, and measured for the fulling.

The carbonizing is done after fulling only when but a very small quantity of vegetable matter is present. If goods containing a large amount of seeds, burrs, etc., are fulled before carbonizing, it is often found necessary to carbonize a second time, as a great part of the vegetable matter has become so firmly imbedded in the body of the cloth that the acid cannot easily reach it. This extra carbonizing is liable to injure the goods.

Some finishers scour the goods before fulling, while others full the cloth in the grease as it comes from the loom. Frequently goods are fulled with acid. We will here give a brief description of the acid process. It will be understood that when fulling is referred to thereafter, the alkali and not the acid process is meant, unless otherwise stated.

Both sulphuric and acetic acid have been used for many years in fulling. Sulphuric acid has been mostly employed for piece dyed goods, felts and similar fabrics. Acetic acid has found the most favor for wool dyed cloths, and sometimes a mixture composed of half of each kind has been found to work well. The strength of the acid solutions varies between 1½ and 2 per cent.

If acid is to be used, the goods should be first thoroughly cleaned, and what is still more important should be well rinsed; otherwise, any alkali left in the goods will neutralize the acid in the fulling process. Fulling goods with acid in the grease has been tried, but the results were not satisfactory.

The fulling-mill in which acid is used must be very clean, and free from soap, or alkali. The tables and benches on which the acidified goods are folded should also be kept very clean; no iron should be exposed, otherwise rust spots will be caused, and the iron destroyed by the acid. An acid proof varnish is now on the market, which is used for covering iron to protect it from acid.

The goods are first saturated with the acid solution. This can be best done in an ordinary washing machine; they are immediately extracted and folded, as damage to the goods is very liable to occur if they lie around for any length of time in the acid. Some finishers full the goods partially in soap, then wash them thoroughly and complete the fulling process with acid. This method is found to work well where a good felt is required inside the fabric as well as outside, as the fulling is done more slowly and thoroughly with the soap than with the acid. After the fulling is completed, the goods are neutralized in the same way as in the carbonizing process.

The finisher can tell whether the goods are thoroughly neutralized or not by testing them with litmus paper. If folds or wrinkles appear in the goods after washing or fulling, they must be handled in a full width washing machine. If this does not remedy the difficulty the piece should be wound on rolls, and placed in hot water; as the goods are still in the gray, the temperature of the water can be raised to 70° C. and the goods left in the bath for an hour. The cloth is now extracted, and in case it is not to be carbonized before fulling, is sent to the fulling-mill. After fulling, the goods are gigged, dried, and cropped. After cropping they are wet out in a washer, and then put back on the gig for the real gigging. The gigging is begun with dull teasles, and these are gradually exchanged for sharper work as the process advances. A double gig is nearly always used; the front cylinder runs against the nap, and contains the sharpest work; the other cylinder runs with the nap. For the finishing part of the process both cylinders are run with the nap. The felt on the face of the goods must be thoroughly cleared out before the gigging is completed; if the "bottom" of the fabric is not clear, the finished goods will show a streaky appearance, which is well known to experts. To examine the felt the workman raises the nap with a knife or needle.

The amount of gigging depends upon the fineness of the goods, and should be continued until a smooth, lustrous face is obtained. The pieces should be kept wet while being gigged, as the fibre is thus softened, and the nap well "laid." In order to "set" the nap the goods are wound, while wet, on rolls, and left in this condition from twelve to twenty-four hours or until the greater part of the water has drained off; the rolls are occasionally turned end for end during this time. The goods are now dried, the nap being brushed down at the same time. They are next back buried and given five or six runs on the cropping shear; after shearing they are brushed, hot pressed in a plate press, then steamed for about a quarter of an hour and left to cool on rolls. Care should be taken not to have the selvages brought under pressure, as wrinkles are liable to form and become pressed into the goods, causing marks which cannot be removed. The goods are next dried and weighed for the dyeing process.

The pieces are wet out before coloring, and if they are to be bottomed with blue they are wet out in about a four per cent. soda solution, and then bottomed. They are then washed in soda and fullers earth, dried and examined for spots or any unevenness in the shade. If the color is not uniform the goods are dyed black. After coloring, the pieces are washed well in fullers earth, and given four or five runs on the gig with dull work to lay the nap. They are then wound on rolls, left for about an hour, and then extracted and dried. The goods are then examined for knots, then steamed and given four or five runs

on the cropping shear, pressed in the plate press, steamed, wet out, and the nap is again brushed down on a gig. The pieces are then wound on rolls, and after about an hour are extracted and dried. The cloth is sheared, and then the finishing is completed by pressing in a cylinder press.

(To be continued.)

Estimating Cost of Woolen Goods.

REPUBLISHED BY REQUEST OF SEVERAL CORRESPONDENTS.

In determining the cost per yard of woolen or other textile fabrics, the problem confronting the manufacturer is very different from that with which the dealer or merchant has to solve. In the case of the latter, the invoices give the cost per yard of the fabrics, and this amount undergoes little or no change while the goods remain in the dealer's possession. Merchandise is sold in the same condition as when purchased, and it is a comparatively easy matter to determine the profit and loss on any particular fabric or sale.

The manufacturer, on the other hand, has no such plain guide to indicate the cost per yard. He invests large sums of money in raw material, in the form of wool as it came from the sheep's back, raw cotton, shoddy, waste in fuel, oil, soap, dyestuffs, chemicals, machinery, repairs to buildings and equipment, and a vast number of other supplies and materials too numerous to mention here. He pays out large sums per month for labor in various departments of the mill, in each one of which some particular process of manufacture is carried on. In return, he finds cloth in a variety of fabrics, and in varying quantity, coming out of the mill in the shape of the finished product.

No clue as to the cost per yard of these various fabrics can be obtained from a mere inspection of the money expended for pay-rolls, raw material, supplies and general expenses; but it is absolutely necessary for the success of the business that this question of cost of each fabric per yard should be determined with a reasonable amount of accuracy. Upon the solution of this problem depends in great measure the success of the business.

With large amounts of invested and borrowed capital employed in manufacturing, there is no gauge to determine from day to day whether the manufacturing business is profitable. If the cost per yard for each fabric is not correctly estimated, the manufacturer may be selling his goods at a loss, or holding them at a figure so high as to prohibit the sale, either course being ruinous to a business. It is not only important for each maufacturer that he be able to determine the cost of his own goods, but it is of nearly as much importance to him that each one of his competitors have the same ability, for the sale of goods regardless of their cost not only ruins the manufacturer himself, but demoralizes the trade, and causes a depression in the value of the products from all other mills.

There may be some excuse for manufacturers seeking to conceal the designs and processes of manufacturing from their competitors, but all should be willing to give every possible aid to others in regard to how to determine the cost of manufacturing goods.

We will consider only general principles now, as any system of cost calculation must necessarily be adjusted to the peculiar conditions and needs of each mill. The cost of raw material per yard can be more easily determined than can the cost of labor and expense, as in the former case only the three following factors are to be reckoned with: cost of raw material per pound; shrinkage in manufacture; the value of the waste products. The fluctuations in the amount of a mill's production from week to week or month to month do not affect the cost per yard of the raw material.

Respecting the cost of raw material we will simply call attention to the necessity of compiling statistics showing the product obtained from material supplied to each department, such

for instance, as the quantity of each lots supplied to scouring and dyeing sort obtained from different lots of departments; yarn obtained from lots

Monthly Statement of a 12-Set Mill
On Dress Goods – 36" Wide

Dept'g	Production	Labor	Expenses	Average Labor	Average Expenses
Sorting	74,765 lbs	$ 299.06		.004	
Scouring	29,906 "	101.68		.0034	
Coloring	29,906 "	221.30	$ 852.32	.0074	.0285
Picking	29,906 "	59.81	86.73	.002	.0029
Carding	148,500 runs	519.75	133.65	.0035	.0009
Spinning	148,500 "	742.20	29.40	.0052	.0002
Spooling Dressing	6187 See Cuts	346.50	13.61	.056	.002
Weaving. Day Work	74,250 yds	534.60	51.98	.0072	.0007
" Piece Work	74,250 "	1752.30		.0236	
Finishing	74,250 "	816.75	185.62	.011	.0025
Repairs	74,250 "	155.92	51.98	.0021	.0007
Ins. & Taxes	74,250 "		371.25		.005
Fuel	74,250 "	60.19	348.98	.001	.0047
Freight, Etc	74,250 "		133.65		.0018
General	74,250 "	482.62	155.92	.0065	.0021
		$ 6142.68	$ 2415.39		

Dividing the labor cost ($6142.68) by the yardage for the month (74,250 yds) gives us .08 37/100, which is average labor cost per yard. Dividing the expense cost ($2415.39) by the yardage (74,250) gives .03 25/100 as the average expense cost per yard – the total for labor and expense being 11 52/100 cents per yard.

wool purchased; weight of scoured or colored stock obtained from different of picked stock; and, the length and weight of finished goods from the

goods as they come from the looms. With these statistics carefully compiled for the different grades of stock, the calculation of the cost per yard of any fabric resolves itself into a simple arithmetical problem, which we will not now consider.

The real difficulty comes when we attempt to estimate the cost per yard for labor, supplies and general expenses. In a mill making one fabric, where all departments have been running full and are well balanced with each other, a fairly accurate estimate of the cost per yard may be secured by dividing the total expenses for any given period by the number of yards produced. Such a calculation, however, in a mill making two or more fabrics, gives simply the average cost of the different grades, and is of no value in determining the cost of any one of them. When we consider the great variety of fabrics manufactured in one woolen mill, ranging from friezes, with 18 or 20 picks and one-run yarn, to goods manufactured from fine worsted yarn and having 100 or more threads per inch, some idea can be formed of the complexity of the problem presented in adjusting the cost of each fabric.

It is this variation in the fabrics manufactured that makes it necessary to adopt some system which is necessarily rather complicated. To begin with the cost of each process must be determined. This can only be done by records of each department, carefully calculated, for a period of at least six months, during which time each department was operated to its full capacity. These statistics form the basis of the subsequent calculations. They not only furnish the facts on which to base the cost estimate of each fabric, but if compiled at stated times, will give a manager a good idea of the work in each department. It will probably be found more convenient to have them compiled monthly, or if a weekly payment of wages is in force, then every four weeks, a period which would cover an even number of pay-rolls. A form for such monthly statements will be found on the opposite page.

It will show at a glance whether each department is doing its work at a greater or less cost than in former months, and a comparison with previous statements will also indicate the effect of any change in machinery, help or methods. Each process or department is its own unit of production, such as the pound of stock for the dye house or picking room, the run of 1600 yards of yarn for carding and spinning, and the woven yard for weaving; the pay-roll and expense account for each department are divided by the product of that department, and the averages placed in the columns marked "average," in the table showing not the price per yard, but the price per production unit in each department.

The fixed charges, such as fuel, freight, insurance, taxes, etc., are necessarily averaged by some arbitrary plan. For this purpose, the department which gives the best measure of production for the whole mill is selected, and the one with the least capacity answers best for this purpose. As yarn can and generally is purchased to keep the room running full, the number of yards woven, in most cases, serves well as a basis for averaging the cost charges. As the goods vary widely in the number of picks per inch, and, consequently, in the yards produced by each loom, this weaving product must be reduced to an equivalent yardage, having a constant number of picks.

We will assume, for illustration, that 50 picks per inch has been taken as a standard. If the product in a given month is 10,000 yards, with an average of 40 picks per inch, this production would be equivalent to 8000 yards having 50 picks per inch. If in another month the weave room production should be 5000 yards, with an average of 80 picks per inch, the equivalent in 50-pick work would still be 8000 yards, and in both cases the 8000 is used to average the general expense. This reduction of yardage

enables much better comparisons to be made between the results of manufacturing during different periods.

When we come to estimate the cost of any particular fabric, we calculate first the quantity of material which must pass through each department or process, in order to produce one cut of the goods in question. For instance, we may find that a cut of cloth which measures 45 yards finished, required the sorting of 200 pounds of wool in the grease, coloring of 70 pounds and picking of 100 pounds of stock, carding and spinning of 250 runs of yarn, dressing of 55 yards of warp, and weaving of 50 yards of cloth. Each one of these items is multiplied by the average of the prices, the fixed charges being calculated per woven yard. The sum total is then divided by 45, the number of finished yards in the cut, and the result is taken as the cost per yard of that fabric for labor and expense. If the cloth contains a greater or less number of picks than 50, the average for fixed charges is increased or decreased in proportion.

This system has been found to work well, but, of course, in it, as in any system that may be adopted, there are certain items which must be calculated by some arbitrary plan, and the only fair test of the accuracy of this or any other system is to extend the yardage of each fabric manufactured between inventory periods at the estimated cost, and compare the total amount with the figures from the mill books.

As we stated in the beginning, any system adopted must be adjusted to meet the requirements of each mill, and the longer the system is followed up, the more valuable and accurate it will become.

FEDERAL.

Best Size for Woolen Mules.

In constructing a woolen mill, the size and gauge of the mules should be determined among the first things settled upon; but some of our mills look as if this had been the last thing that was thought of. The cost and quality of the work is influenced a great deal by having the spinning machinery adapted to the class of goods to be manufactured. If the particular class of goods to be manufactured was definitely known in advance, the spinning machinery could be selected in such a way as to effect a large saving, but as the woolen business is now carried on, it is impossible for a mill to confine itself for any great length of time to a particular class of goods or stock.

Most of the mills are required to change their product frequently, in order to meet the varying demands of the trade, and machinery adapted for a certain class of work is often found unsuited for the goods called for by the trade. Today, the market demands something cheap, and the manufacturer who offers a sightly piece of goods at a lower price than his competitors, gets the business. As a general rule, the yarn for cheap goods is spun coarser than for the better grades. More low stock can be used in heavy yarn than in the finer counts, and it is for this reason that the spinning machinery of the mill must be adapted for coarse, as well as fine yarn.

Frequently in our dress goods mills, the machinery is kept running year in and year out on a fine or medium size yarn, and in such cases it is found advantageous to have the mules short, say about 200 spindles, and set in pairs, so that one spinner can run two machines. The advantage consists in the fact that the spinner has a much shorter distance to travel in order to reach all of the spindles, and the stoppage while doffing, splicing in spools, or for break-downs, effects only one-half of the spindles, as during this time the other machine can be kept running.

These same remarks apply equally well for coarse yarns, but in spinning such yarns, the stock is generally of such a character that there is more breakage, and 400 spindles prove generally to be more than one spinner

can handle. For this reason, I have found it more economical on the coarser counts to operate 300 or 312 spindle mules. A two-inch gauge answers very well for a mill spinning a wide range of sizes. Gauges below two inches are objectionable on coarse yarn, owing to the threads catching together while twisting.

Uniformity of speed is a very important thing in mule spinning, as in all other kinds of woolen machinery, and manufacturers will find it a profitable investment to adopt the latest and most improved methods of speed regulation.

DURHAM.

Mill Management.

The writer of this is past three score years and ten, and has been in control of a woolen mill for nearly forty years, but never a superintendent, and this may be a reason that I should offer to tell what a superintendent should be. He should be in every part a gentleman, never speaking sharply, or in the least cross to his overseers or the help in the factory. A crisp or sharp answer is always far reaching. It makes the parties so spoken to uneasy, and they make up their minds to look up another job, while a kind answer and in a condescending tone will draw them nearer, and cause them to both admire and love him. Such a "Super" can always keep his help as long as they fill the bill, and when he no longer requires their services, do it in a kindly way, with a possible future in view. It always pays.

A superintendent or an overseer should never be late to work, or early to quit. He should always be ready and waiting to see that every man is at his post, and this should under all circumstances be the case as to superintendent. He should be first at the works in the morning, and when the doors are opened should enter, visit the different departments, and so learn who is occasionally or habitually late, thus posting himself without apparent effort. In this way he informs himself of the characteristics of all, and when he wants to advance an employee from the ranks to a better position, he knows whom to select.

When he has been through every department and found things to his satisfaction, that all parts are running in a proper manner, he should, say at eight o'clock, or eight-fifty, as the better half can arrange best, retire for breakfast. His mind should be at rest, so that he can eat and enjoy with his wife and family a good breakfast, at leisure, feeling and knowing that all is in proper shape at the mill. After looking over his morning paper, and smoking, if he chooses, he will go back to his labors, passing from room to room with a good word for any and all workmen that come in his path. In this way, he has a pleasant life, no enemies, and is not continually on the lookout for help.

The "Super" should not only understand when finished goods are right, but should understand the processes in each department. When the finished goods come to the perch, and imperfections appear, he should know the cause. Every boss weaver can tell him where it is. Every carder, dyer or spinner can tell him where the trouble is, but it is never in their department; it is always the other fellow, and if the "Super" is not properly posted, he is very liable to blame the wrong man, as the true culprit is perhaps the best talker; anyway, he is frequently the most tricky, and it is unfair to be deceived by such men. This is why a "Super" before taking charge of a mill should spend a season in every department, so that he is able also to give reasons for these defects, as well as the department bosses.

If you consider the above of no value, it will be satisfactory to the writer if it is laid at rest in the proper receptacle, or as an editor said the other day, when a supposed joke was sent to him, "There being no stamp for return postage, I lit my pipe with the joke." If you use this in this way, it will not ruffle my feelings.

LET LIVE.

KNITTING DEPARTMENT

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

The Knit Goods Situation.

Nothing of importance has occurred during the past few weeks to disturb the quiet surface of the knit goods market, and conditions remain practically unchanged. So far as first orders are concerned, the season's business is practically over, and very little new business need be expected until the season is further advanced and duplicates begin to come in.

While there is no question but that the initial orders are small, as compared with last season's buying, there is every reason to believe, in view of the existing prosperity throughout the country that a good business will be done, and this conservatism on the part of buyers will in all probability result in larger duplicate orders than usual.

For immediate delivery balbriggans are already in considerable demand and fair duplicates are being received on ladies' ribbed goods, but the extremely cold and unseasonable weather has undoubtedly retarded retail sales; until more seasonable weather is experienced, no large volume of duplicates on summer goods need be expected.

Not a word has been heard for a considerable time concerning the formerly much talked of Underwear Manufacturers' Trust, and it is reported in trade circles that the project has been abandoned, but the truth of this report we are unable to verify. It is possible that the negotiations may still be quietly progressing, and some day, when least expected, the consummation of the deal may be announced.

Several important changes have been made, or are about to be made in local hosiery and underwear circles in New York City. One of the most important of these being the transferring of the long established hosiery and underwear stock of James McCreery & Co., to a new concern, who will do business through a down-town commission house. It is also reported on good authority that one of the down-town jobbers, who was always considered particularly strong on hosiery and underwear, is making preparations to close out these lines permanently.

In the domestic hosiery market there has been a slight weakening of prices on men's half hose and children's ribbed goods, but ladies' cotton and lisle hose are still held at the ruling prices of one month ago.

The volume of business on hosiery for spring delivery has been extremely satisfactory, and good business has been booked on ladies' fleeced hose for fall, but the lines of woolen hosiery have not sold quite so freely and some reductions in prices have been reported.

Recent advices from the Chemnitz market report a slight weakening in prices of staple black cotton hosiery, which may be bought at from 10 to 20 pfenning lower than the prices of a few weeks ago; but it is expected that the influx of American buyers, many of whom are now on the water or about to sail, will restore prices to their former level.

Lace-lisles and open work effects of every description are in strong demand; many of the principal manufacturers having their production sold up to September and October. Jacquards are in fair demand, with prices sta-

tionary. Red is a noticeably prominent color and bids fair to be the leading shade of the season in hosiery.

The demand for hosiery yarns has not been very satisfactory, most of the business done during the past week showing a decline of from a quarter to a half cent from the ruling prices of two weeks ago. The system of curtailment has evidently not produced as satisfactory results as were looked for, but it is expected that the period for running on short time will be extended longer than was originally intended, and it is possible that the desired results may be produced, particularly if the underwear business should show an improvement.

In the line of fancy knit goods, possibly there is no particular article that is occupying so much attention as the ladies' golf vest, a brief reference to which was made in a recent issue. With the advance of the season this garment's popularity is steadily increasing, resulting in the production of a multiplicity of new and striking designs and colorings. This garment, although originally designed for the golf devotee has come into general favor and is now worn for bicycling, yachting or other outdoor sports, and even for wear at the sea-side; in fact, it is a general utility garment where comfort and ease are combined with elegance and beauty of design. Red is the popular shade, but many beautiful combinations are shown.

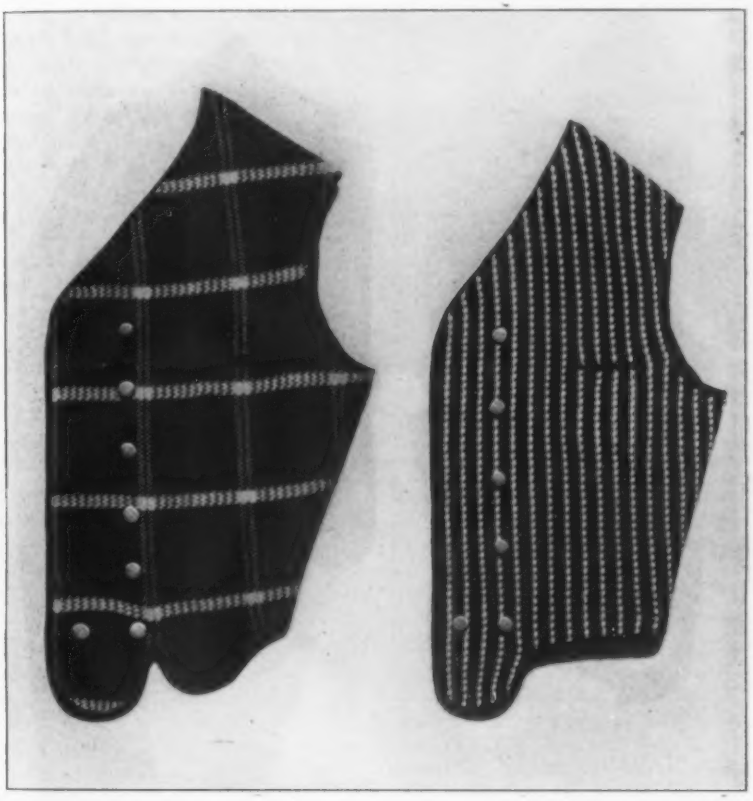


FIG. 1. FIG. 2.

Figure 1 represents a popular selling style, designed with the new double scalloped front; bright red in color, with large knit plaid of single and double black and white stripes, the edges bound with a silk braid and the garment lined with a silk facing. This is a typical golf jacket and gives a truly "Scotchy" appearance to the wearer. It is very effectively trimmed with bright brass buttons and has a watch-pocket of simple design, and just sufficiently large to hold a ladies' watch.

A very striking weave is shown at Figure 2. This garment is of an entirely different shape from Figure 1, and has met with approval by local buyers. In color it is also red, with vertical white woven stripes of mercerized cotton, trimmed with mohair buttons and mohair binding, and faced with silk of the shade of the garment.

At Figure 3 is illustrated what is perhaps the handsomest garment of the entire line. This is made in red or green, with dainty design woven in white mercerized cotton, and is known as the double breasted pointed shape.

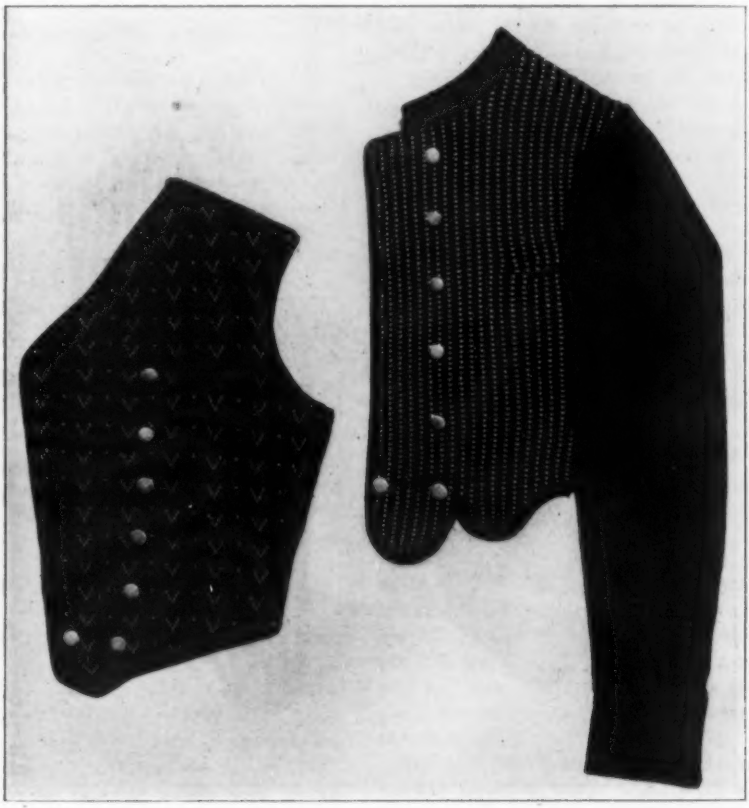


FIG. 3. FIG. 5.

At Figure 4 we illustrate another handsome garment, which is a distinct novelty, in that it has a plaid collar, with notched lapels. The color of this garment is green, with bright red woven dots in vertical patterns. This garment is very handsomely trimmed with silk binding, silk facing and

watch-pocket, and proves a very attractive number.

The above styles represent but a few of the many shapes, styles and combinations of colorings, in fact, any one of these particular shapes may be had in any of the weaves described, and all of these garments may be had with sleeves if desired, in either silk, flannel or knitted fabric; the silk, of course, being the favorite and by far the more effective. The sleeves, by the way, are not always in color to match the garment but are sometimes shown in decidedly contrasting colors. This garment is an all-year-round seller and even now is meeting with a ready sale in some of the best retail stores throughout the country.

FIG. 4.

At Figure 5 we illustrate still another garment, which is an entire novelty in its line, and, although somewhat similar in appearance to the golf vest, may better be described as a knitted flannel shirtwaist. It is not designed to fit so tightly as the golf vest, and is made with high cut front and fashioned neck-band, designed to be worn with linen collar and tie. This garment of course should be worn with sleeves with buttoned cuff, and trimmed with the bright brass buttons and neat watch-pocket, it is a decidedly striking and

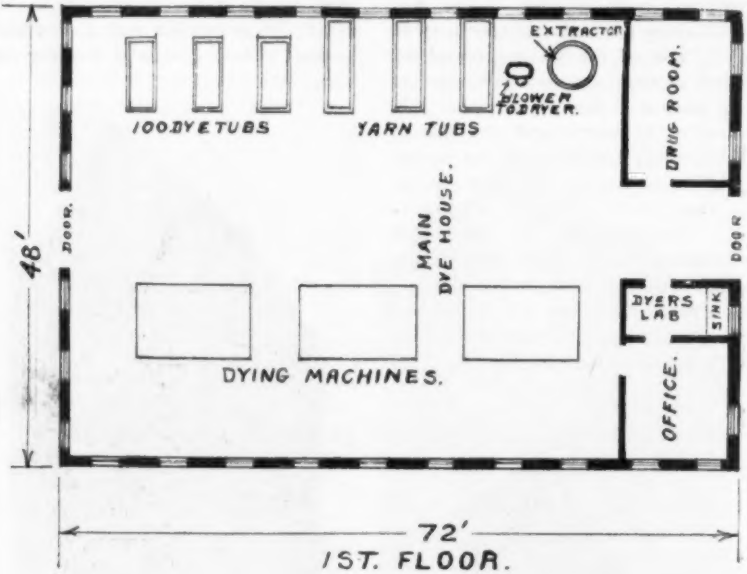
FIG. 6

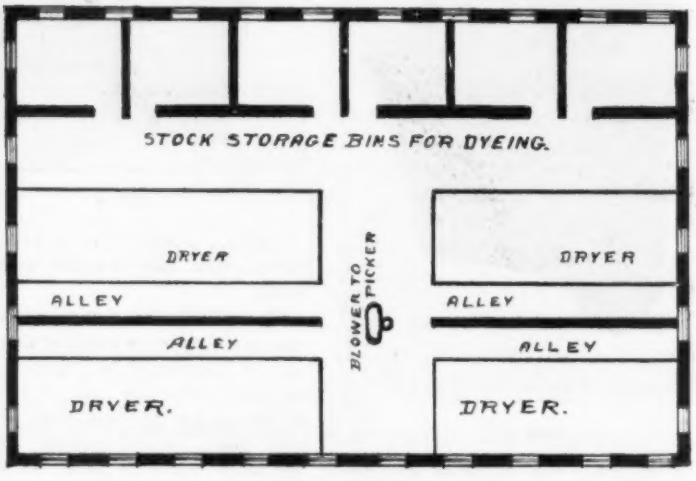
attractive adjunct to a tailor-made dress when intended for out-of-door wear.

The golf jacket for men's wear is also meeting with considerable favor, and is illustrated in Figure 6. This garment, like the majority of the others, is red in color, with neat vertical black striped pattern in front, but plain weave in back. It is made with side pockets and silk sleeves; neatly trimmed with brass buttons, it presents a very attractive appearance, and is meeting with a ready sale alongside of the ladies' garments.

A matter of considerable importance was brought to the attention of

the writer this week, in connection with the duty on ribbed Swiss underwear, the custom officials at the appraisers' stores in New York having advanced an invoice from 20 to 33 per cent. The goods were invoiced by the importer as "unfinished Swiss ribbed underwear," with valuation of $1.50 per dozen; they claiming that the finishing process was to be completed in this city. The customs officials however, claimed that this valuation was not correct, and that the goods are already in a finished state. and advanced the invoices, assessing them for duty under paragraph 319 of the tariff act of 1897. The case has been referred to the General Appraiser of the port for reappraisement and his decision is looked for with considerable interest.





A Knit Goods Dyehouse.

The accompanying plan shows my idea of the arrangement of a dyehouse for a knitting mill, on ribbed underwear, manufactured from mixed stock; it has a capacity of 3500 to 4000 pounds per day.

The equipment consists of three dye tubs, 8 by 3 by 3 feet, for coloring 100-pound lots when required; three yarn tubs for coloring any yarn, thread or tape needed; and three machines of the Delahunty type, each of 500 pounds capacity. Each machine should be kept for a particular character of dyes as far as possible; that is to say, one should be retained for blues, another for pinks, flesh colors, etc., and a third for tan shades.

The stock, either cotton or wool, is blown from the opener in the picking room, to bins in the second story of the dyehouse. It is then sent to the dyeing machines, through boxes or chutes, and after dyeing is washed, sent to the extractor, extracted and blown up stairs to the drying tables, and, when dry, is blown to bins in either the picker room or storehouse.

Table dryers are shown in the plan. Either hot or cold air can be used, and if preferred, a machine dryer may be substituted for these tables. If a machine is used, the stock can be blown from the extractor to the machine, and then carried by a fan from the dryer to the bins, thus avoiding handling by the operative.

The dry stock can be carded much better, if it is allowed to remain in the bins long enough to absorb the natural moisture lost in drying. I believe it much better to dry either cotton or wool with a cold air draft, as a high temperature injures the staple.

The plan shows the dyer's office, experimental laboratory and drug room in the main building, near to each other, and easily reached by the workmen in the dyehouse. The office should be provided with a good light, and well fitted with drawers and shelves for samples. It should also have a small book case, to contain the dyer's library. The laboratory need not be very extensive, but a good set of laboratory tools, such as scales, a gas stove, several small experimental kettles, hydrometers, thermometers, and a sink, are of much value to a dyer and the concern he is working for.

The main dyehouse should be well ventilated, and a good sewer provided, to carry off the waste liquor. The steam and water pipes should be of a sufficient capacity to fill the kettles and boil them quickly, and whenever possible, a hot water heater should be used and warm water supplied to the dyehouse. This saves time and dry steam.

The pipes for conveying the stock from the dyehouse to the dry room should be made of galvanized iron, 12 inches in diameter, with switches to send the stock to any desired place. They should be provided with small sliding doors, or hand-holes, to enable the workmen to clear the pipes when they get clogged with stock.

If the table dryers are used, it is better to partition each dryer off, making it a room by itself. The walls of the door should be tinned, as this enables them to be cleaned easily, and the partitions prevent the mixing of different colors.

The writer does not claim perfection for this plan, but submits it as the result of his observations as a practical dyer, made during a series of years. He believes that if adopted, it will save much labor and do away with much unnecessary handling of stock, as compared with the ordinary dyehouse now found in our mills. It also enables the dyer to produce more uniform shades, because he will be able to color any desired amount the required shade, and by carefully mixing the different dips, he will be able to make a large batch of one shade; it is feasible to handle 10,000 pounds or even more in this way, and it will result in a great improvement in the appearance of the goods.

The old idea that anything is good enough for the dyehouse, is played out. Manufacturers are coming to the opinion that it pays to provide

this important department with the best facilities for doing the work. A good dyehouse is an important aid in maintaining and increasing the dividends of the mill.

ROGER WILLIAMS.

Silk Finish on Hosiery.

A process for finishing hosiery to impart a "silk" or "lisle" finish to the goods, forms the subject of two patents recently issued.

The inventor states he has found that the nap or lint on the surface of a stocking, for instance, a cotton stocking, can be removed most effectually if the stocking is stretched or distended so that the threads are spread apart. In this way the flames or other singeing medium employed can reach substantially every fibre that forms this nap or lint, it being apparent that when the stocking is in its unstretched state the flame or other singeing medium cannot reach all of these fibres forming the nap or lint.

In carrying out this process the stocking is stretched over a board or former, which serves to stretch the stocking, so that its threads are separated. The stocking thus stretched is passed through the singeing-machine, and the nap or lint is removed by the singeing operation.

This singeing can be most effectually accomplished by treating the hosiery before singeing, so that the nap or lint can be more effectually removed when the stocking is singed, for instance, by first saturating the stocking when white or in its natural condition in a solution consisting of the following ingredients:—chlorid of soda or chlorid of potash, one pound; blue stone, one-half pound; anilin salt or anilin oil, four or five pounds. This is an "anilin-black" solution, and is the first step in the process of dyeing goods fast black. After thorough saturation the goods are dried, and are then in an oxidized state.

It is while they are in this condition with the threads pulled apart by being stretched upon a former, that they are passed through the singeing-machine to remove the nap or lint.

After the stockings are thus singed they are finished, the finisher or finishing agent being, for instance, chrome of soda or chrome of potash, this being the concluding step in a process of dyeing goods fast black.

The inventor states that by a mechanical treatment, it is possible to remove some portions of the nap or lint from the exterior surface; but such treatment not only also removes the nap or lint from the interior surface of the stockings, but weakens the threads, with the consequence that the strength of the stocking is materially affected, so that the article produced in this manner does not possess the desired strength and wearing qualities.

Besides this in a combined chemical and mechanical treatment it is found that the length of time necessary to subject the goods to the mechanical treatment is such that the threads are weakened by the chemicals and the strength and wearing qualities of the stockings further impaired.

The strength of a stocking that has been singed, however, is not affected. It retains its original and desired wearing qualities, but does not have the objectionable nap or lint on its exterior face.

The appearance of the threads is not deadened, and they stand out clearly and distinctly, presenting a clean and smooth appearance, and thus impart to the stocking the fine surface and luster known as a "silk" or "lisle" finish.

Another and important advantage possessed by a stocking having a singed exterior surface is that it improves the dye. For instance, upon a comparison of two stockings, one of which has been singed and both of which have been dyed fast black by the same process and with precisely the same solutions, the singed stocking is a deeper and clearer black and of finer appearance.

That a singed stocking not only has the silk or lisle finish, which is due to the absence of lint or nap on its exterior surface, but it presents a deeper black

SILK DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Loom Harness.

A device has been invented by which loom heddles are strung on a wire or cord in such a way as to prevent their being contracted or lengthened as desired.

The inventor states that one object of this invention is to produce a new and improved loom-harness which can be made in unlimited series and sold in bunches, say, of one thousand heddles each, more or less, and from which the weaver can readily make a harness of as many heddles to the inch as are necessary, as the heddles are capable of adjustment toward and from each other on the shafts, and the harness is not apt to become tangled in handling; they can be manufactured much cheaper than any other harness, and enable the weaver to build up a harness of any desired density of heddles.

A further object of the invention is to provide a ready, simple, and effective means for holding the heddles securely in place on the shaft after they have been adjusted according to the special requirements.

Fig. 1 is a vertical transverse sectional view through a shaft on which the harness shown in Fig. 2 is applied.

The heddles A, which may be of any material suitable for the purpose, are united at the edges of the harness by one or more binders B, which are separately attached to the heddles and are flexible, so as to permit of adjusting the individual heddles toward or from each other and so as to make a harness of any desired density of heddles; that is, to have a greater or less number of heddles to the lineal inch of harness. A piece of the harness of a certain width can

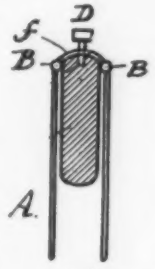


Fig. 1.

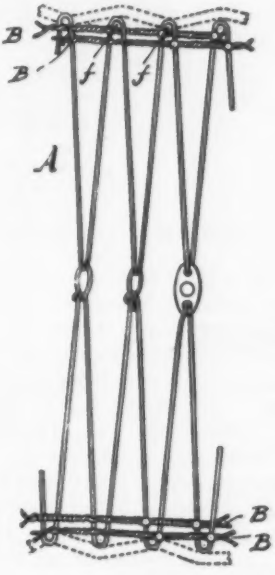


Fig. 2.

thus be contracted or extended, according to requirements, and the binders can be severed between any two heddles without destroying the heddles or injuring the harness.

When this harness is applied on the shaft, the bights f straddle the shaft and the binders B lie one on each side of the longitudinal central plane of the shaft a short distance from each other.

The several heddles are held in place after having been adjusted by means of a locking-bar D.

Machine for Cleaning Silk Yarn.

This machine, the invention of Diedrichs and Marquelet, is intended for removing knots, bunches and coarse places from silk yarn, and by that means producing a fabric of much greater smoothness and regularity than has heretofore been possible, while at the same time increasing the production. Figure 1 represents an elevation, and Fig. 2 a plan of the devise. B is a bobbin on which the yarn to be cleaned is wound, and G is the

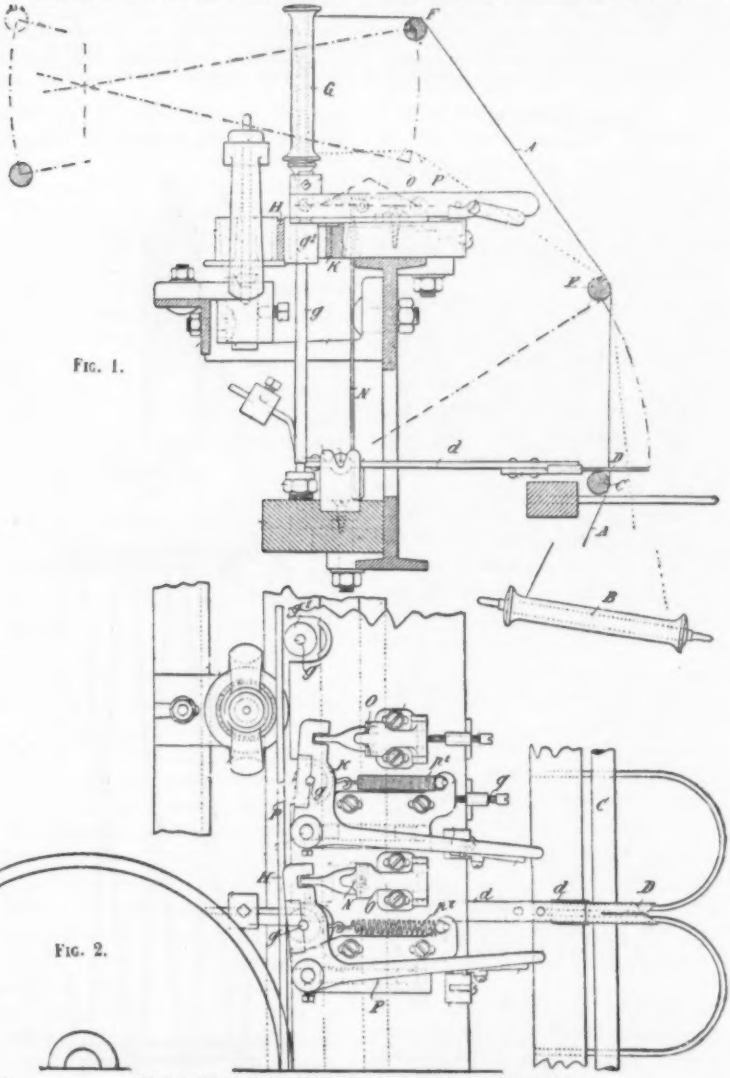
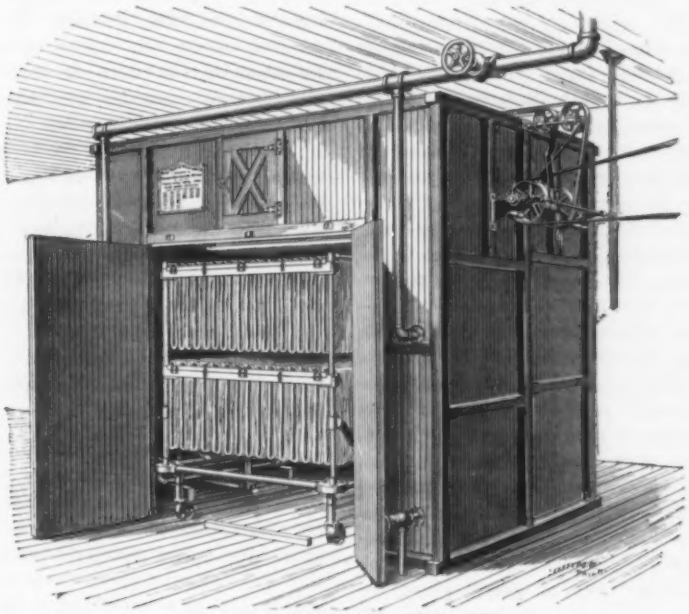


Fig. 1.

Fig. 2.

PLAN OF MACHINE FOR CLEANING SILK YARN.

bobbin which receives the yarn after it has been cleaned. During the passage of the yarn, it passes over the glass rods (C), (D) and (E) and a guide (F), the latter being mounted on an oscillating lever, the axis of which is at f. The bobbin (G) is placed on a spindle (g), driven by a leather belt (H), from suitable pulleys. The yarn (A) unwinds from the bobbin (B), and passes to the rod (D). If a knot is in the yarn, it is caught in the narrow slit in D and raises this rod, which is balanced by a counter weight (d). The rod (D) rises then and balances on its axis, and at the same time raises the stem (N). This stem strikes against the hinge (O), the two parts of which double up, and no longer supporting the lever (P), release the spring (p2). The pulley (g2) then comes in contact with the break (K) and stops the spindle. When the spindle is stopped in this way, and the fault in the yarn corrected, operations are resumed as follows: The carrier (d) is lowered to the glass bar (C); the lever (P) is replaced in such a position that the pulley (g2) comes in contact with the belt (H); this starts the spindle (g), and the parts are kept in this position by the hinge (O); the hinge possesses the great advantage of being very sensitive, and this makes the device suitable for all kinds of yarn, even very fine numbers. The stoppage is effected instantly, and does not cause any breakage of yarn.—L'Industrie Textile.



CYCLONE DRYER FOR SKEIN SILK.

Modern Drying Methods.

The results obtained by the use of modern drying machines have done much to impair the time-honored theory that the only proper method of drying textile materials is to hang them out of doors or in an old-fashioned drying room with a low temperature. This theory was based on the fact that any excessive temperature applied under these conditions will prove detrimental to both the color and the quality of the stock.

The old drying rooms generally used for this purpose, contained no means of circulating the air and removing the evaporated moisture, in order to keep the point of saturation within

economical limits. This method resulted in baking the yarn, and when it was ready to be removed from the dryer, it was practically the same temperature as the air surrounding it. The art of drying, however, has developed greatly and today manufacturers can avail themselves of the economy effected in drying at high temperatures, while avoiding to a great extent the danger of injury to the fibre.

The accompanying illustration shows a Cyclone dryer for skein silk, which has been built according to the most approved principles. A mild circulation of air in large volume is maintained within the dryer, and the same percentage of saturated air is being constantly withdrawn and fresh air admitted, while the drying is going on. The temperature of the enclosure is raised to about 125° F.

The builders claim that the production is greatly increased, with a corresponding decrease in the floor space and steam required to dry a given quantity of yarn, and the results obtained from this machine warrant them in claiming that it is excelled in efficiency by no dryer now on the market, particularly for the handling of delicate shades on silk yarns. The skeins are hung on poles, which are placed on trucks and run into the dryer, as shown in the illustration, and the drying is effected by circulating the air through the dryers, and the radiators which are placed on each side of the dryer.

These machines are made in various sizes, the capacity ranging from 500 to 2000 pounds in ten hours. Further information can be obtained from the builders, the Philadelphia Textile Machinery Company, Hancock and Somerset Sts., Philadelphia, Pa.

—In March we called attention to the inflation of silk goods production, and the manner in which such enterprises are promoted. These methods receive a striking illustration in a newspaper article which recently appeared in a local journal in a town where the enlargement of a silk mill was proposed. The article concluded as follows:

—"American silks have become well known and much sought in foreign countries, and our almost unlimited power of production gives promise that they will soon occupy first place among such goods in the world's market."

Contrast this with the government statement of value of exports of silk goods: for year 1898, $299,074; for 1899, $290,729; for 1900, $251,591. This is the way people are led to subscribe for stock in silk mills in the belief that foreign countries are clamoring for American silks, whereas the fact is that our exports of such goods amount to practically nothing while we import an immense quantity, as is shown by the following figures of imports of silk manufacturers: imports for 1898, $23,523,655; 1899, $25,109,074; 1900, $30,894,966. Over one hundred and twenty-two dollars' worth of silk goods was imported into the United States for every dollar's worth exported, in the year 1900.

—Reports from Lyons indicate a better feeling in the silk trade. Business is more active. Manufacturers are making purchases of raw material after a long period during which they have allowed their stocks to run low in the expectation of a further decline in prices; in this they have been disappointed, as reports from Yokohama state that the stocks there amount to scarcely 13,000 bales. The consequent strengthening of prices for the raw material has been accompanied by an improvement in the goods trade; this has been due to the purchases induced by a return to former low prices and by the diminished stock of goods following the curtailment of production in 1900. The French silk market is however, free from the influence of speculative purchases.

—Regrets improve nothing; to abandon oneself to them is to sacrifice the present for a past which is no longer ours.—Dufresnes.

POWER DEPARTMENT

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Power Transmission.

The transmission of power by belts depends primarily upon securing sufficient contact between the belt and pulleys, and suitable tension on the belt in order to secure the friction between belt and pulley required to transmit the power.

The power transmitted depends therefore upon the tension of the belt, the arc of contact on the pulley and the angle at which the belt passes to the pulley.

The simplest arrangement is the open belt (shown at Fig. 1A), which can be operated at any angle from horizontal to perpendicular. For horizontal belts the distance between the shafts should not be less than the combined diameter of the two pulleys plus 6½ feet. When the belt is run at an angle greater than 45°, the distance between shafts should be from 10 to 13 feet more than the combined diameter of the two pulleys.

It should also be observed that, when the lower half of horizontal

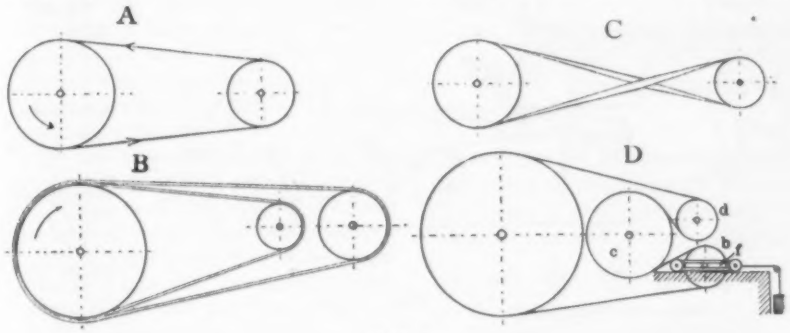


FIG. 1.

A German contemporary, the Technische Rundschau, treats this subject in an instructive manner. This journal says: We will not consider now the method of calculating the thickness of belt for various conditions; in practice one will not go far astray by using a belt from ⅛ to ¼-inch thick and about ⅜-inch narrower than the face of the pulley. The necessary tension may be secured in two ways: either by regulating the length so that when the belt is run on the pulley the tension due to its inherent elasticity is sufficient, or by the employment of special tension devices. Whatever method is employed, care should be taken to have the belt run in the centre of the pulley face.

belts is the driving portion, the upper part sinks by its own weight and thus brings the belt in contact with a greater portion of the pulley circumference.

In the simple open belt arrangement shown at Fig. 1A, the surface speed of each pulley is the same, and the revolutions per minute will vary in inverse proportion to their diameters; thus if the driver is running 100 revolutions per minute and has a diameter double that of the driven pulley, the latter will run 200 revolutions per minute.

Recently the arrangement shown at Fig. 1B has been frequently employed, by which two pulleys on separate shafts are driven by the same

driving pulley; while there are certain objections to this arrangement, it has the advantage of dispensing with one shaft.

If the distance between shafts is small, carrier and tension pulleys are employed to give the belt the necessary tension and contact with the pulley. They can be arranged either as shown in Fig. 2E, where the tension is due to the weight of the idler on the belt; or as shown at Fig. 1D, where the carrier is movable; in the latter case the tension can be regulated as desired. In both cases a uniform tension, which is unaffected by the stretching of the belt, is secured.

The arrangements shown at Fig. 1D and Fig. 2E are recommended for cases where, owing to the short distance between the shafts, the weight of the belt is not sufficient to produce the required tension; in this way excessive stretching of belts is avoided; and the splicings can be cemented instead of riveted or sewed, thus a better contact of the belt with the pulley.

Lastly it may be said that by the use of idlers a great advantage over the direct drive is obtained, owing to the much greater arc of contact of the belt on the pulley. This enables the tension to be reduced, and results in prolonging the life of the belt. To offset these advantages, we have the disadvantage of additional pulleys, and the necessity of providing belts that can withstand the additional wear caused by having both sides exposed to the wear and tension of the pulleys.

By the arrangement of idlers shown at Fig. 1D, the belt passes from the driver a over the adjustable idler b to the driven pulley c, and from this over a carrier d back to the driver. Local conditions must govern the particular arrangement adopted, but the following examples will show that extremely difficult problems may be solved by the use of tension pulleys:

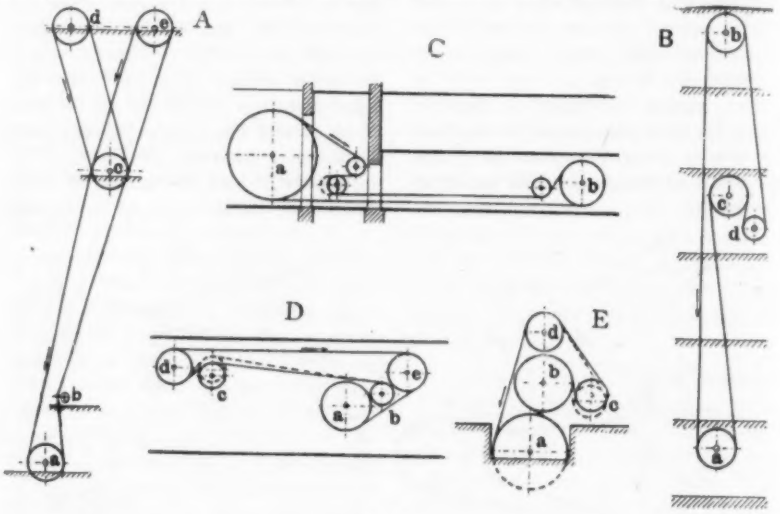


FIG. 2.

By the arrangement shown at Fig. 2B, power is carried through five stories; the distance between shafts a and b is 73 feet. The driving pulley a has a diameter of 83 inches, and a width of 35½ inches, and at a speed of 140 revolutions per minute transmits 400 horse-power. The belt runs from pulley a over the pulley c, and then around the tension roll d; this tension roll is 47½ inches in diameter; from this idler the belt runs to the pulley b. The pulleys b and c are

each 71½ inches in diameter, with a speed of 161 revolutions per minute.

The same amount of power may be transmitted by the arrangement shown at Fig. 2A. The pulley a has a width of 53 inches, and a diameter of 119 inches, making 60 turns per minute. The upper pulleys, c, d, and e, have each the same dimensions as a, and the tension roll b is 47 inches in diameter. The distance from a to c is 98 feet, and from c to d, or e, is 47 feet.

A peculiar arrangement where there was but little room between the shafts is shown at Fig. 2E. The driving pulley a is 42 inches wide, has a diameter of 99 inches, and transmits 520 horse power to the pulley b, which is 58 inches in diameter. As the distance between the shafts is only 90 inches, the tension roll c, 46 inches in diameter, and the guide roll d, 47½ inches in diameter, are employed. The belt is 42 inches wide, and ⅝ of an inch thick. The driving pulley runs 110 revolutions, and the driven, 187 revolutions per minute.

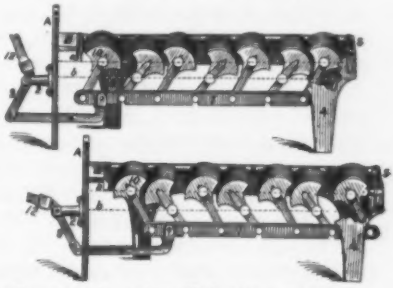
By the arrangement shown at Fig. 2D, 240 H. P. can be transmitted from the pulley a to the pulley d. The belt runs from a over the carrier pulley b and the tension pulley c, to the driven pulleys d and e. The speed of each pulley is as follows: a, 140; d, 190; and e, 170 revolutions per minute.

Four hundred and seventy-five H. P. is transmitted by the arrangement illustrated at Fig. 2C. Pulley a, 68 revolutions per minute, has a diameter of 20 feet. The driven pulley b, 136 revolutions per minute, has a diameter of ten feet. The belt is ⅜ of an inch thick, and 36 inches wide, so that the area of a section of the belt is 13½ square inches. The speed of the belt is about 69 feet per minute, and the idler and tension pulleys each have the same diameter, 47½ inches.

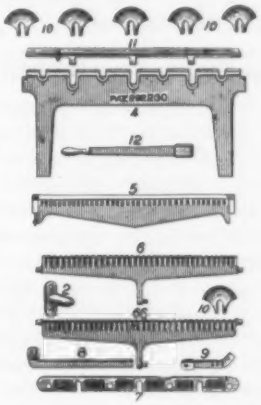
Economical Firing of Steam Boilers.

It is well known by all practical engineers that perfect firing is not attainable by firemen provided with ordinary slice bars, pokers and hoes. The economical consumption of coal depends to a large extent upon keeping the fires clean, free from ashes

and clinkers, and it is no reflection upon the firemen as a class to say that the highest efficiency is seldom, if ever, secured in this work. Human



endurance is not sufficient to maintain the fires at all times in such condition that they will give the best results for the coal consumed.



It is to remedy this defect that the United States Rocking Grate Bar has been put upon the market. The builders claim that by the use of this device, which is shown in the accompanying illustration, the slice bars,

pokers and hoes can be taken from the fire room entirely, and that the firemen can maintain a clean fire at all times by simply operating this grate.

In addition to the great economy effected by having the fire at all times in good condition, there are other advantages claimed for this grate bar, such as the reduced cost of repairs. The only part of the grate which requires repairs is that on which the coal rests. They are shown at No. 10 in the illustration. The fire does not come in contact with the cross bars, and, consequently, there is no danger of their burning out. They will last as long, it is said, as the boiler lasts. The grate is set in a frame, and has a clearance of one-half inch from the walls. The builders state that this is another advantage of the grate, as it permits of a saving on brick work.

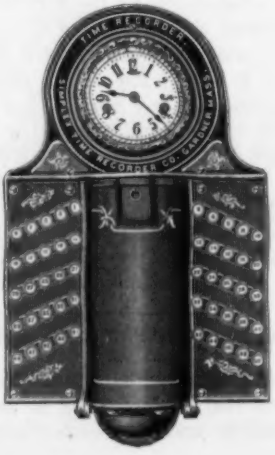
The manufacturers, The United States Rocking Grate Bar Company, Elizabeth, N. J., state that by the use of this grate bar, the fires will be found in as good condition when shutting down at night, as when starting with fresh fires in the morning. They invite interested parties to correspond with them, and will be pleased to give further information in regard to the apparatus.

The Simplex Time Recorder.

The accompanying illustration shows a device for recording at the mill the arrival and departure of each employee. It does this work with machine-like accuracy, is always on duty, and makes no allowances and accepts no excuses. The time is recorded by perforations on a sheet inside of the recorder. This time sheet is wrapped around a vertical cylinder, which is revolved slowly and continuously by clock work.

A button is assigned to each employee, and upon his arrival or departure this button is pressed, and makes the time record. This is all that is required of an employee, and each button registers independently of all others. In this way, one hand does not have to wait his turn to register;

it is claimed that this makes the Simplex the most rapid time recorder on the market. Actual tests show that



100 employees can register easily in one minute.

The manufacturers are now building what is called The New Interlocking Simplex, which is proving very popular. This recorder is fitted with a special lock attachment, so constructed that when one button is pushed, all the others are firmly locked, preventing one employee registering without a separate ring of the alarm bell. It is claimed that this does not lessen the capacity of the machine.

The Simplex Time Recorder Company, Gardner, Mass., builders of these recorders, will give parties interested any further information desired.

Automatic Boiler Pressure Controller for Mechanical Draft.

Mechanical draft, and especially mechanical induced draft, may safely be characterized as the economy factor of modern boiler practice. Of the many advantages following in the train of induced draft none has been so instrumental in causing its rapid introduction and development as the marked savings effected thereby.

The essential feature of mechanical induced draft may be said to reside in the application of a fan between smoke box and stack to create the draft which is necessary to supply oxygen to the fuel and which it has been the function of the chimney heretofore to produce. In the case of a fan installation the stack ceases to become the draft agent and hence need only be of a height sufficient to discharge the gases so they will not be obnoxious. The heat of the gaseous products of combustion is now no longer necessary, as in the case of the chimney, to create the necessary draft and may therefore be extracted by the agency of economizers or feed water heaters, thus reducing to a minimum the greatest source of loss which the boiler plant knows.

It will be seen that instead of being a fixed quantity as in the case of a chimney, the intensity of the draft may be varied by means of the fan engine speed. Thus when increased steam consumption or other causes occasion a fall in the boiler pressure, the deficiency may be made good by an extra turn of the fan engine throttle. It often becomes desirable that this regulation for a constant steam pressure should be made automatically, and this is easily accomplished by placing a pressure regulating valve in the steam pipe of the engine which drives the fan. Such a device may be so adjusted as to cause the fan engine speed and hence the intensity of draft to be increased whenever the pressure tends to fall off, thus giving a very nearly constant boiler pressure.

In these days, however, the steam engine is by no means the only motive agent which is utilized for fan driving. In many situations the electric motor, either belted or direct-connected, has been found to be by far the most suitable arrangement for fan work, being peculiarly adapted to such service by reason of the identity of motion of the driving and driven portions of such a combination. The application of motors for driving the fans of induced draft plants has involved the problem of speed regulation for a constant steam pressure as in the case of the steam driven fan heretofore mentioned.

This problem has been solved by the Buffalo Forge Co., of Buffalo, N. Y., who in their various mechanical draft installations are now able to arrange for automatic control of the fan motor speed. This is effected through the medium of a special motor controller actuated by fluctuating boiler power. In this way exceedingly close regulation of the boiler pressure can be obtained with a minimum need of attention on the part of the fireman, though of course it is not to be implied that the latter individual under such arrangements need become simply a figure-head.

—The first step toward right is to avoid wrong.—Rousseau.

DYEING DEPARTMENT

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Dye Recipes for May.

Recipe No. 65.

Black on Cotton and Woolen Union Goods.

Niagara Union Black on 100 lbs. of cotton and woolen union goods.

Prepare the dye bath with

4 lbs. Niagara Union Black.

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

20 lbs. Common Salt.

Enter the goods at 120° F., put on steam, bring bath gradually to a boil, boil one hour and allow to remain in the cooling bath 30 minutes longer. Lift, wash, and dry.

Niagara Union Black will be found an even dyeing color, for cotton and woolen union goods.

Recipe No. 66.

Blue on Mercerized Cotton Yarn.

Benzo Fast Blue B N on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

3 lbs. Benzo Fast Blue B N.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Glauber's Salt.

2 lbs. Soda Ash.

Enter at 180°, bring to a boil, and dye at this temperature one hour.

Benzo Fast Blue B N is particularly interesting, on account of its fastness to light.

Recipe No. 67.

Yellow on Worsted Yarn.

Mordant Yellow O on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Mordant Yellow O.

(Victor Koechl & Co., 122 Hudson St., New York.)

10 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid.

Enter the material at 150° to 175° F., bring to a boil and dye at this temperature for one hour, then add

1½ lbs. Potassium Bichromate

and boil twenty-five minutes longer.

Mordant Yellow O possesses good fastness to all the ordinary destructive agencies, and is well adapted for the production of compound shades.

Recipe No. 68.

Buffalo Black 10 B on Worsted Yarn.

Buffalo Black 10 B on 100 lbs. of worsted yarn.

Prepare the dye bath with

5 lbs. Buffalo Black 10 B.

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

10 lbs. Glauber's Salt.

Enter yarn at 180° F., bring to a boil, and after 15 minutes add

3 lbs. Acetic Acid.

Boil 30 minutes longer, and add slowly,

3 lbs. Sulphuric Acid.

and boil 15 to 20 minutes longer.

Buffalo Black 10 B will be found to be a very cheap dyestuff, and if applied according to the above directions, will produce even, and heavy shades, with a comparatively low percentage of dyestuff.

Recipe No. 69.

Bright Red on Worsted Yarn.

Fulling Red R on 100 lbs. of worsted yarn.

Prepare the dye bath with

2 lbs. Fulling Red R.

(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)

4 lbs. Sulphuric Acid.

20 lbs. Glauber's Salt.

Enter the yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Fulling Red R gives very bright shades of red, which possess marked fastness to light, washing, scouring, and fulling.

This red is well adapted for combination with other dyestuffs in the production of compound shades, and is applicable to all classes of wool goods.

Recipe No. 70.

Olive Green on Worsted Yarn.

Compound Shade on 100 lbs. of worsted yarn.

First, mordant the yarn in a bath, containing

3 lbs. Potassium Dichromate.

2 lbs. of Tartar.

Enter at 140° F., bring to a boil, and mordant at this temperature for 1½ hours.

Then dye in a bath containing

3 lbs. Anthracene Yellow G N.

4 lbs. Anthracene Blue C B.

(C. Bischoff & Co., 87-89 Park Place, New York.)

adding 2 lbs. of Acetic Acid to exhaust the bath.

Enter at 150° F., bring to a boil, and dye at this temperature for not less than one hour.

When dyed in this way, the color produced will be found very fast to all the common color destroying agencies.

Recipe No. 71.

Green on Mercerized Cotton Yarn.

Sultan Green on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

2 lbs. of Sultan Green.

(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

15 lbs. Common Salt.

Enter the material at 160° F., bring to a boil, and dye at this temperature for one hour.

Sultan Green dyes exceedingly well on cotton, and on cotton and wool mixed goods, giving bright shades.

Recipe No. 72.

Medium Blue on Worsted Yarn.

Fulling Blue B G on 100 lbs. of worsted yarn.

Prepare the dye bath with

2 lbs. Fulling Blue B G.

(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)

4 lbs. Sulphuric Acid.

20 lbs. Glauber's Salt.

Enter the yarn, which has been thoroughly scoured and cleansed, at 180° F., and turn while raising to the boil. Continue the boiling for ¾ hours. Wash and dry.

Fulling Blue B G gives very bright and rather greenish shades of blue, which possess a marked degree of fastness to scouring, fulling, and light. The bath exhausts easily, and as the color develops gradually on the fibre, there is little danger of streaked shades.

This blue is well adapted for combination with other colors, and is applicable to all kinds of wool material.

Recipe No. 73.

Brown on Cotton Yarn.

Alsace Brown L L on 100 lbs. of cotton yarn.

Prepare dye bath with

4 lbs. Alsace Brown L L.

(F. E. Atteaux & Co., 176 Purchase St., Boston.)

20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at this temperature for one hour.

Alsace Brown possesses all the qualities characteristic of the direct cotton colors and may be used for union goods.

Recipe No. 74.

Green on Worsted Yarn.

Kitone Green on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Kitone Green.

(A. Klipstein & Co., 122 Pearl St., New York.)

15 lbs. Glauber's Salt.

3 lbs. Sulphuric Acid (added gradually).

Enter at 160° F., bring to a boil, and dye to shade.

Kitone Green produces shades which are absolutely fast to alkalies, and stands washing and stoving very well. It goes on evenly, and is well adapted for use in dyeing compound shades.

Recipe No. 75.

Brown on Mercerized Cotton Yarn.

Benzo Brown R C on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

4 lbs. Benzo Brown R C.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Glauber's Salt.

2 lbs. Soda Ash.

Enter at 180° F., bring to a boil, and dye at this temperature one hour.

Benzo Brown R C is a valuable direct brown on account of cheapness, and level dyeing properties. It can be diazetized and developed.

Recipe No. 76.

Black on Cotton Yarn.

Pyrogen Black B D on 100 lbs. of cotton yarn.

Prepare the dye bath with

15 lbs. Pyrogen Black B D.

(A. Klipstein & Co., 122 Pearl St., New York.)

15 lbs. Sulphide of Soda.

5 lbs. Soda Ash.

Finally, add

50 lbs. Common Salt.

Enter the goods at 150° F., and run between this, and 190° F., for 1½ hours.

After dyeing, it is well to pass the yarn through a wringer, and wash immediately.

During the dyeing, the goods should be kept below the surface of the dye liquor, and all copper about the dyeing apparatus should be avoided.

Pyrogen Black B D produces a color exceptionally fast to light and washing.

Recipe No. 77.

Brown on Woolen Cloth.

Meta Chrome Brown B on 100 lbs. of woolen cloth.

Prepare the dye bath with

7 lbs. Metachrome Brown B.

(Berlin Aniline Works, 72 Front St., New York.)

7 lbs. Meta Chrome.

10 lbs. Glauber's Salt.

Enter at 100° F., raise to the boil during ¾ of an hour, and then boil for a further hour in order to completely fix the dyestuff. To this latter point especial attention is drawn since the dyeing operation must not be considered as being completed when the bath appears exhausted.

The fastness of Meta-chrome Brown B to milling, light, air, alkalies and acids is excellent.

Recipe No. 78.

Yellow on Worsted Yarn.

Anthracene Yellow G N on 100 lbs. of worsted yarn.

First mordant yarn in a bath containing

3 lbs. Potassium Dichromate.

2 lbs. Tartar.

Enter at 140° F., bring to a boil, and mordant at this temperature for 1½ hours.

Then, dye in bath, containing

3 lbs. Anthracene Yellow G N.

(C. Bischoff & Co., 87-89 Park Place, New York.)

Adding, 2 lbs. of Acetic Acid to exhaust the bath.

Enter at 150° F., bring to a boil, and dye at this temperature for not less than one hour.

When dyed in this way, the color produced will be found very fast to all the common color destroying agencies.

Recipe No. 79.

Blue on Mercerized Cotton Yarn.

Tetrazo Blue 4 R on 100 lbs. of Mercerized Cotton Yarn.

Prepare the dye bath with

3 lbs. Tetrazo Blue 4 R.

(New York & Boston Dyewood Co., 55 Beekman St., New York.)

25 lbs. Glauber's Salt.

1 lb. Soda Ash.

Enter the material at 180° F., bring to a boil, and dye at this temperature for one hour.

Tetrazo Blue 4 R is one of a new series of direct cotton colors recently put on the market by the above firm, and possesses all the characteristic properties of the direct cotton colors.

Recipe No. 80.

Bluish Green on Worsted Yarn.

Cyanole Green B on 100 lbs. of worsted yarn.

Prepare the dye bath with

½ lb. Cyanole Green B.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

15 lbs. Glauber's Salt.

2 lbs. Sulphuric Acid.

Enter yarn at 170° F., bring to a boil, and dye to shade.

Cyanole Green B produces very brilliant bluish shades of green, of good fastness, and is valuable in the production of compound shades.

Pneumatic Dyeing Machines.

The dyeing machine invented by M. Dumons (reference to which was made in the March issue of the Textile World) is shown in the accompanying illustrations. R and R′, Fig. 1, are two reservoirs for the dyeing liquor. P is a vessel provided with two perforated false bottoms (F and F′), between which the material to be dyed is placed. As shown in the illustration, this vessel (P) is connected at either end by pipes with the tanks R and R′. D is a four-way valve for automatically changing the air pressure from one to the other two tanks R and R′. The compressed air enters through pipe (A) and E is the pipe through which the air escapes. V is a valve in the pipe E, used for regulating the back pressure, so that all or only a portion of the pressure may be utilized for driving the liquor through the material to be dyed.

The operation of the machine is as follows: Assuming that at the commencement of the operation, the vessel R′ is filled with liquor as shown in the illustration, the valve is placed in the position shown, by which the air passes through A to the pipe R′, and bringing the full pressure on the liquor, forces it through the tank P and into the tank R.

The valve D is at the same time in such position as to allow the air to escape from R through the pipe E, and the extent to which the valve V

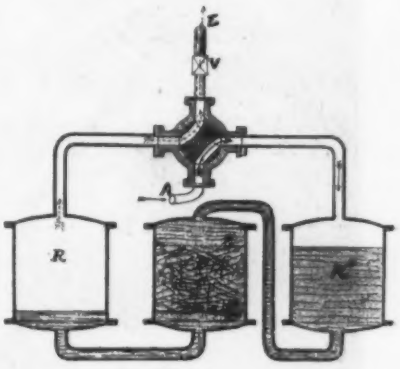


FIG. 1.

is open determines the rapidity with which the liquor is forced through the material and into the tank R. When all of the liquor has passed into the tank R, an automatic arrangement changes the valve so that the air supply through the pipe A is connected with the top of the tank R which now contains the liquor, and the top of tank R′ is at the same time connected with the escape pipe E. In this way, the previous operation is reversed, and the liquor is driven from R to R′, through the material, in the reverse direction, and the rapidity with which this is performed is regulated by the same valve V in the escape pipe.

In this way, the liquor alternately passes from the top to the bottom and from the bottom to the top of the material to be dyed. It is claimed that

this method is much superior to forcing the liquor through the material by means of pumps, on account of its being more uniform. The air pressure itself and the opening of the valve V are the two factors which determine the pressure with which the liquor is forced through the material, and these two factors being kept uniform there is nothing to cause a variation. This, it is claimed, results in a uniform distribution of the coloring matter throughout the material, and short stock can be colored to much greater advantage than by the pump method; there is less displacement of the material, such as occurs when dyeing tops and yarn. It is stated that this machine has been in use for two years, and has given good results in the production of uniform colors, being easily regulated, and perfectly automatic, no skilled labor being required in the operation of the machine. A perspective view of the machine is shown at Fig. 2.

L'Industrie Textile states that members of their staff have examined the machine in operation, and that it gives very good results in the dyeing of delicate colors on worsted top. It is well known that top treated in the Obermaier machine is left in such a condition that it is necessary to run it through the gill box a number of times in order to straighten out the fibres; this is not the case with top coloring in the Dumons machine. It is said that the material comes out in as good condition as when it went in. It is also said to be suited for the coloring of cotton sliver and yarn on bobbins, as well as top, raw wool and cotton.

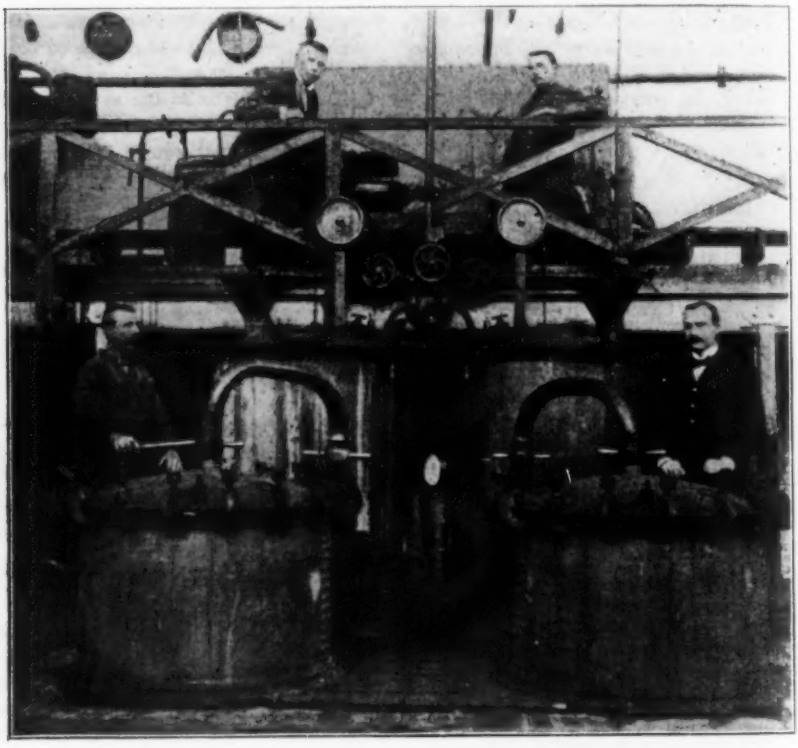


FIG. 2.

The Reclaiming of Indigo Remaining in the Vats.

After the lime and copperas indigo vats have been run down as low as is practicable in the coloring of calico, there still remains more or less indigo in solution, as well as a certain quantity precipitated at the bottom of the tub, and the value of this indigo is sufficient to warrant the expense of recovering it.

To save the indigo remaining in solution, the usual method is to let the liquor stand for a while, and then pump it into another bath, which has not yet been exhausted, instead of introducing so much clear water.

The sediment at the bottom of the tub is treated in three different ways: (1) The precipitate is subjected to the action of an excess of hydrochloric acid, which dissolves at least partially the lime, iron and copper, and leaves the indigo insoluble. While this process is very simple, it does not work very well in practice. It requires a large quantity of acid to neutralize the lime, and that does not dissolve the sulphate of lime as well as the particles of fibre, which collect at the bottom of the tub. In consequence a certain quantity of indigo will still remain attached to this foreign matter and be lost.

(2). This is the cold water process; a series of large tubs is placed on a lower level than that of the vats, but connected with them. Each tub is somewhat lower than the preceding one. The sediment in the tubs is well mixed with cold water, vigorously stirred and allowed to settle. As soon as the insoluble portion of the sediment is precipitated to the bottom, the liquor is run into the large tub on the next level, and then the operation is repeated with the sediment which still remains in the tubs, and is continued as long as any indigo can be washed from the sediment.

The indigo in the water in the lower tubs quickly oxidizes, and is precipitated to the bottom, and by having a series of these receptacles placed each one lower than the preceding one, the operation can be carried on until nothing but clear water runs from the last one. The liquor is removed carefully from the tubs from time to time, and the indigo taken out. This process is simple, requires little attention, and no expense for material; yet, the quantity of indigo recovered is even less than that obtained by the first process.

(3). This process is evidently the best, especially where there is not room for the tubs required for the second process. It is perhaps the best under any circumstances. It consists in boiling the residue in caustic acid and yellow arsenic. The reducing liquor is composed of one kilo. of yellow arsenic, four litres of caustic soda, and two litres of water. The arsenic is previously ground very fine, and the three ingredients are boiled in an iron vessel, effecting a thorough mixing. Generally, about 30 gallons are prepared. Three or four litres of the solution are then put in the tub containing the indigo sediment. Steam is introduced, and the liquor is allowed to settle. The liquor is then run into the other receptacles, and from them pumped into an elevated reservoir in the open air. The troughs which conduct this liquor to the reservoir are made as wide and shallow as possible, in order to expose the liquid thoroughly to the air, and thus effect a rapid oxidization of the indigo. In this way, the indigo precipitates quickly, after reaching the reservoir. The clear warm water in which the indigo has already been deposited is preferred to clear water for the preparation of the new reducing solutions for lime, zinc or bisulphite vats.

Where there is very little residue, the best plan is to force air into the bath. This will cause the indigo in suspension to oxidize and be rapidly precipitated. The liquor is then allowed to stand, and the precipitate is afterwards treated with a small quantity of hydrochloric acid, which dissolves any oxide of zinc which may be present, and leaves the pure indigo

ready to be used for another bath. It will generally be found says Moniteur de la Teinture, that the expense and trouble of extracting the indigo pays for itself. The expense is very little in comparison with the value of the indigo saved.

Electrolysis in Bleaching Textiles.

The U. S. Consul at Eibenstock, Germany, sends a description of an electrolytic bleaching process, the invention of a German, Dr. Oettel.

The ordinary apparatus is extremely simple (see Fig. 1), being mainly a trough or box of slate, swung on trunnions, in a suitable frame, with an inlet for the brine and an outlet for the sodium hypochlorite resulting from the passage of a current of electricity through the brine as it runs through the box, the poles or electrodes being placed at opposite ends of the box, as shown by the engraving. Thermometers are suspended at the inlet and at the outlet, in order to show at a glance the strength of the sodium hypochlorite, it having been found that every rise of 5° Celsius corresponds to 1 gram of free or active chlorine per liter (equal to 62 grains per gallon).

In order to clean the apparatus, the thermometers are removed and the trough reversed and cleansed with a hose pipe. The electrodes last about one year and can be easily replaced.

The advantages claimed for this system are:

(1) The electrolyzed solution possesses the highest decolorizing or bleaching power.

(2) The goods treated in the ordinary process of bleaching are not harmed in the least, and there is scarcely any appreciable loss in weight.

(3) Lime or magnesia salts are not deposited on the cloth, thereby eliminating any possible trouble in subsequent dyeing and printing.

(4) Constant strength of liquor, which can be used as fast as made, if desired.

(5) Economy in cost of production.

The apparatus is constructed in three sizes, to produce, per 10 hours, respectively, 350, 650 and 1000 gallons of electrolyzed solution, containing 3 grams per liter (equal to 186 grains per gallon) of active chlorine, prepared from brine of a strength of 6° Baume.

For purposes of comparison, we

may say that 650 gallons of the electrolyzed solution contains 20 pounds of active chlorine; to obtain from chloride of lime 20 pounds of active chlorine, it would be necessary to use 70 pounds of bleaching powder, and the resulting 650 gallons would be found to give considerably inferior results. The reason of this apparently inexplicable difference lies in the constitution of the electrolyzed liquor, which has been found to contain the following: Free chlorine, free hydrochlorous acid, sodium, hypochlorite, and chlorate of soda. It is chiefly the free hypochlorous acid which causes the rapid bleach. This solution is absolutely harmless to the fibres of the threads, the best proof that they are in no way injured being that goods bleached by electrolysis only lose about 2 per cent., as against some 8 per cent. for chloride of lime bleach.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Cost of Manufacturing Worsted Yarn.

Editor Textile World:

I have read with much interest your reply to "Worsted," in the March issue, regarding the cost of manufacturing worsted yarn. Your estimate is about right, so far as the average mill goes, but labor conditions and mill equipment vary so much in different mills that it is possible for some mills to manufacture yarn at a less cost than others. The last six or nine months have been a time of very close figuring on the part of worsted spinners, to make both ends meet, as the price of yarn has been down nearly to the cost of top. Take, for instance, the case which you cited, of a small plant, with a weekly production of 5000 pounds 2/32s. If this production can be turned out at a cost of 12 88/100 cents, instead of 14 88/100 cents, it will make a difference of $101.80 per week, which is frequently enough to turn the scale from a profit to a loss. I have been much interested in reading the March issue, and consider the paper on humidity especially valuable. A conditioning house could be made even more useful than the writer states. The article on "Room Management from a Speeder Tender's Point of View" is very good. Her remarks apply with equal force to woolen and worsted mills.

Falcon.

Cost of Worsted Yarn in the United States and Abroad.

Editor Textile World:

How does the price of fine worsted yarn in the United States compare with the price of similar goods in England?

Comparison (117).

In another part of this issue there will be found a letter contributed by an English correspondent, in which the present prices of English worsted yarns are given, as well as quotations on worsted coatings in the Bradford market; comparisons can be made between these figures and the quotations for similar grades of American yarns which are given in our regular market report.

Yarn Tables.

Editor Textile World:

Kindly inform us where we can obtain a yarn table relating to cotton, woolen and worsted yarns.

Table (106).

In the Textile World's Directory will be found, on pages 368, 370 and 371, Comparative Yarn Tables, showing the equivalent sizes of cotton, woolen, worsted and other yarns.

Skein Yarn Polishing Machine.

Editor Textile World:

Where can I obtain machinery for polishing skein yarn?

Polish (112).

We will place any interested parties in communication with this inquirer.

Bleaching Woolen Blankets.

Editor Textile World:

We cannot keep the rust spots from our white woolen blankets. The goods are bleached with sulphur, and the trouble occurs more frequently in winter, and on the cotton warp goods. Can you suggest a remedy? What other methods of bleaching wool are used besides the old sulphur process?

Brimstone (78).

Rust spots are liable to be caused by presence of iron in bleaching with sulphur. Iron such as nail heads, etc., exposed in the bleach house, might cause the trouble which "Brimstone" complains of. If the presence of iron is thoroughly excluded during the bleaching process, we are inclined to think that spots will not appear. In addition to bleaching with sulphur, wool may be bleached by means of a solution of sulphurous acid, or bisulphite of soda. The wool is steeped for about 20 hours in a strong solution of sulphurous acid, then extracted and washed. For bleaching with bisulphite of soda, the scoured wool is steeped for about 12 hours in a solution of bisulphite, at 32 degrees Tw. The wool is then extracted and treated to a 6 per cent. sulphuric acid bath. During recent years, Peroxide of Sodium has been employed with most excellent results for bleaching wool. Full particulars of the process were given on page 655, October, 1900, issue of the Textile World. The Roessler & Hasslacher

Chemical Company, 100 William Street, New York, are agents for Peroxide of Sodium.

Twister for Heading Yarn.

Editor Textile World:

We need a machine for doubling yarn for weaving headings. Yarn will be very soft twisted. Can you inform me who makes such a machine?

Bed Blanket (85).

There is no twister made specially for twisting heading yarn in small quantities. Such yarn is generally twisted on an ordinary yarn twister. We have known of odds and ends of yarn being wound double by hand on the bobbins, and the yarn would become sufficiently twisted in passing from one bobbin to the other to weave all right in the loom; but, if a harder twisted yarn is required, it would be necessary to have this work done either on a jack or twister. In such a case, the regular machine could be used, twisting enough at one time to last for several months, and in this way avoid the interruption to the work which would accompany twisting in small quantities.

Changing Weight of Fabrics.

Editor Textile World:

Can you give me a method for changing the counts and texture of fabrics, to produce a required change in weight?

Freight (110).

There exist numerous rules for making such calculations, which are of doubtful practical utility. There are so many varying conditions which serve to modify the methods to be adopted for effecting this change, that however well founded and scientific a rule may be for one fabric and material, it is apt to fail in answering the requirements of others. In practice, there are generally certain requirements which accompany a request for increasing or decreasing the weight of a fabric. In the case of a four-leaf twill, where it may be desired to increase the weight from 12 to 15 ounces, it is not an uncommon case that the requirement is made that the twill shall not be made any wider than before; then all the manufacturer has to do, is to increase the size of the yarn. In some cases this can be done, but in others, where the yarn is tender, it results in trouble on account of the increased tightness of the weft and strain on the yarn. If such a request is made in regard to a six-leaf twill fabric, the increase of three ounces can generally be made readily without reducing the threads per inch.

Iron in Mill Construction.

Editor Textile World:

I have been much interested in the article on "The Use of Iron in Mill Construction." The subject of mill floors is very important, and I would like to suggest to "Mechanic" a combination floor beam, which he has evidently overlooked. As he states, beams 14 by 12 are very expensive, and when they dry out, are apt to warp and twist badly. This can be obviated by using two pieces 14 in. by 6 in., bolted together with a steel plate 14 in. by 1 in. sandwiched between them. This, I believe, will combine the best features of wood and iron, and be a correct solution of the problem. "Mechanic" states in the last paragraph that one advantage of the all iron beam, is that it can be built solidly into the wall. This statement is quite true, but building these beams into the wall is just what causes the wall to collapse in case of fire. To my mind, a far better plan, instead of building solidly into the wall, is to build a cast iron box in the masonry, and have a roller at the bottom of this box. Let the box be as deep as the wall is thick, less one course of brick. The iron girder will fit into this box with two inches space between the end of the beam and brick work. This space will be sufficient to allow for expansion in case of fire, and if it should expand more, the only result will be to push out one course of bricks, instead of pushing the whole wall down.

Falcon.

Weave or Finishing Book.

Editor Textile World:

Where can I get a weave or finishing room book, such as is used for recording weight of goods, picks, weavers' names, etc.?

Weave-Book (115).

We believe that these books are generally made to order for the mills. Each manager is apt to have some peculiar idea in regard to the ruling of the book; for this reason, there is no form which would suit very many mills.

Depreciation of Textile Machinery.

Editor Textile World:

Where can I secure information regarding the depreciation of textile mill property?

Worn-out.

Valuable articles on this subject have appeared in the following issues of the Textile World: December, 1897, January and February, 1898, March and May, 1899.

Book on Cloth Examining.

Editor Textile World:

I am a woolen cloth examiner. Where can I get a book which will give me information as to the examining of woolens?

Examiner (116).

We believe that there is no work de-

voted specially to cloth examining. Examiner will be able to secure valuable information that will help him in his work from any of the books on textile manufacturing. The more a cloth examiner knows about manufacturing, the better equipped he is for his duties.

We would suggest, Hummel's Manual of Dyeing, price $1.75, Beaumont's Woolen Manufacture, price $2.00, and McLaren's Woolen and Worsted Spinning, price $1.50.

Patents in Foreign Countries.

Editor Textile World:

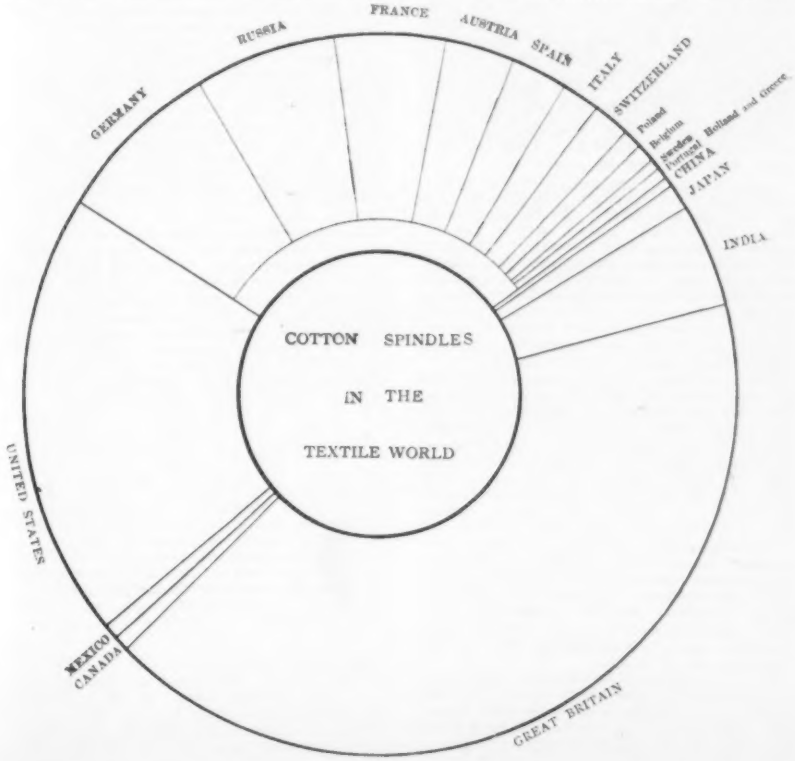
In what foreign countries would you advise me to have an invention relating to cotton manufacturing patented? How many cotton spindles are there in Sweden?

Foreign Patent (103).

The question as to what countries to have an invention relating to cotton manufacturing patented, depends upon the character of the invention, as well as the number of spindles in the country in question. The invention might be so valuable and effect such a great improvement in cotton manufacturing, that it would be advisable to have it patented in all countries, whereas it would be inadvisable to go to the expense of patenting other inventions of less importance, in countries containing but a small number of spindles. The following list gives the number of cotton spindles in each country, and also the percentage which each bears to the whole, and the accompanying chart will show at a glance the relative importance of each country in the cotton spinning industry. With these figures and this chart before our correspondent, we think he will have the necessary information to decide in which countries it would be best to secure patents.

NUMBER OF COTTON SPINDLES IN EACH OF THE COUNTRIES OF THE WORLD.

	Spindles.	% of total.
Great Britain	45,400,000	42
United States	21,500,000	19.96
Germany	7,896,000	7.33
Russia	7,000,000	6.50
France	5,300,000	4.92
Austria	3,455,000	3.21
Spain	2,615,000	2.43
Italy	1,886,000	1.75
Switzerland	1,710,000	1.59
Poland	965,000	.89
Belgium	900,000	.84
Canada	697,000	.65
Mexico	700,000	.65
Sweden	360,000	.33
Holland, Portugal and Greece	590,000	.55
China	520,000	.48
Japan	1,273,000	1.18
India	4,945,000	4.59
Total	107,712,000	100.00



New Publications.

The Finishing of Woolen and Half Woolen Goods, by N. Reiser; 592 pages, 371 illustrations. Arthur Felix, Leipzig. Price $7.50.

This work treats in a very thorough manner of the finishing of woolen and mixed goods. The subject is handled in a systematic manner, each class of goods being taken up in turn, and the various processes employed for different kinds of finish are described. The different machines used in the finishing department, are described and illustrated. A work on finishing in the English language is greatly needed at the present time. This is a branch of the industry which has been neglected by authors.

This work treats of the subject from a German standpoint, but while this may make it somewhat unsuited for the wants of American manufacturers, there is the advantage of getting a view of other methods than our own.

The work can be imported through this office.

Technical, Industrial and Commercial Vocabulary. By E. Hospitalier. Price $2.00. This, as its name indicates, is a commercial and technical dictionary, giving the equivalents of each word in English, French and German. The words are arranged alphabetically, irrespective of the languages, and by this means the book is suited equally well to the requirements of either English, French or German readers. There is great need of such a book as this, in order to facilitate communication between merchants and manufacturers of different countries. It is an extension of the Electrical Industrial Dictionary, published by L'Industrie Electrique, in 1900, and the success which the first publication met with, has encouraged the publishers to bring out a more extended work. The Textile World will import this book for any desiring a copy, upon receipt of price.

Engineering Practice and Theory for Steam Engineers. By W. H. Wakeman. Price $1.00.

The author states on the title page that this book has been written for the benefit of those men in charge of steam plants who wish to improve their knowledge of steam engineering, and enable them to pass examinations where a license is required, and to do more satisfactory work wherever a steam engine is found.

The following abstract of a table of contents gives an idea of the ground covered by the work: Practical and theoretical engineers; construction of boilers, safety valves, their location and regulation; heating surface of boilers; evaporation of water per pound of coal, with rules for calculation and formulas; the indicator; the compound engine; expansion and clearance; receivers; tandem and cross-compound engines; taking diagrams; quadruple expansion engines; pumps and economy of water; weighing coal; descriptions of various pumping engines; pumping against pressure; injectors; covering steam pipes; heating with exhaust steam; reducing pressure; and temperature of steam.

The book is well written from a practical standpoint, and the illustrations add much to its value. It is a convenient size, well bound, and cannot fail to be of value to all interested in steam power.

Bleaching of Linen and Cotton. By L. Tailfer, Chemical and Mechanical Engineer. Translated from the French. 294 pages. Illustrated. Price $7.50.

The literature in the English language on the subject of bleaching has received an important addition by the translation of this work. The author, in his preface, states that he has been guided in the composition of the treatise not only by his own experience as manager and director of bleaching works, but also by information obtained in the trade from managers, foremen and workmen, and from standard works on the subject. One advantage that this work possesses, is that it is written from a French standpoint, and will give English readers an opportunity of learning about methods employed outside of English speaking lands. The following outline of the contents will give an idea of the scope of the work: General Considerations on Bleaching; Steeping; Washing, Its End and Importance; Lye-Boiling; Mather & Platt Keir; Soap; Bleaching on Grass; Chemicking; Sours; Drying; Damage to Fabrics in Bleaching; Methods Used in Bleaching; Valuation of Caustic and Carbonated Alkali; Chlorometry; Chlorine and Decoloring Chlorides; Water; Bleaching of Yarn; Installation of a Bleach Works.

Color Decoration of Surfaces. By Rene Beauclair. Julius Hoffman, Stuttgart, Germany. $12. This is a series of 32 sheets of colored designs; each sheet contains four or more designs for the decoration of surfaces of various kinds. It is an unusually fine collection, and the colorings are combined with good effect. These patterns will give a designer valuable suggestions to work on. It is impossible to give the reader any idea of the beauty of these designs. This can only be obtained by seeing them. We have a set at our office, that we shall be pleased to show to anyone interested, and we will import them if desired.

Practical Guide Book for the Setting Up and Operation of Power Looms. By Emil Oberholzer. This is a handbook, pocket size, of 48 pages, containing brief practical directions in regard to the care and running of power looms. It cannot fail to be of great use to weavers. It is in the German language, and relates mainly to looms used on the other side, but many of the suggestions apply equally well to any power loom.

The Chemistry of Every-day Life. By Prof. Lassar Cohn. 309 pages. Numerous illustrations. Leopold Voss, Hamburg. Price, $1.50.

This work treats the difficult subject of Chemistry in a popular manner, suited to the requirements of the average reader. It has been translated into English, Russian, Italian, and several other languages. The original work is in German, and its popularity in different countries is sufficient proof of its merit.

Handbook of Weaving. By J. Schams. 2 volumes. 268 pages of reading matter. 648 illustrations. Bernh. Friedr. Voigt, Leipzig. Price $12.

This hand-book of weaving is printed in the German language, and begins with

a historical account of the development of weaving. Chapters are devoted to an exhaustive account of the different materials used in the manufacture of fabrics. Methods of weighing, measuring and calculating yarn and material are given, and then the subject of weaving is treated in a very thorough manner from a German standpoint. Much of the work, however, is of general interest to manufacturers in every country. The many illustrations add much to the value of the work. The difficulties met with in weaving are considered very carefully, and the reader will find in this work information varying upon every branch of the subject.

The following abstract of table of contents gives but a very slight idea of the scope of the work: History of Weaving; Spinning Materials; Preparation of Textile Fibres for Spinning; Yarn Numbering; Hand Weaving, including Warping and Sizing; Power Weaving. Each of these branches of the subject is treated in a detailed and thorough manner. The work can be imported through our office.

Loom Fixing and Weaving, by G. F. Ivey; 113 pages. Price $1.25.

This is the second edition of a work treating of fixing of cotton looms, and of weaving in general. It is written by a practical man who evidently understands his business, and the following outline of the table of contents, will show the scope of the work. Chapter 1, History of Weaving. 2, Grades of cotton; slashing and sizing. 3, The plain loom; reeds and picking motions. 4, Setting up and starting new looms; belting; setting the motions; lease rods and harness. 5, Difficulties encountered by a loom fixer; slamming off; shuttle flying out; thin places; cutting filling; selvedge. 6, Defects in cotton cloth and their remedies; kinky filling; reedy cloth; cockley cloth. 7, The Northrop loom; shuttles; warp and filling; stop motions, steel harness; temples; production. 8, Weaver's calculations, numbering of yarn. 9, Management of a weave room, general hints for the overseer and fixer. The whole of Chapter VII is devoted to the Northrop loom.

Les Tisseurs en Soie de Lyon, A. Rey et Cie. This is a pamphlet issued by the Chambre Syndicale des Tisseurs of Lyons, France, in which an account is given of the industrial condition of the silk workers from the establishment of the industry in Lyons, to the present day. The wages, hours of labor, and method of living in early times, are touched upon, also the successive changes which have resulted in the conditions existing today.

The society that issues this book was organized to promote the interests and welfare of the silk workers of Lyons, and from time to time since it was established, branches have been organized to carry on business in various lines for the profit of the association; the first one was that of buying and selling coal, which was started in 1885 and, it is stated, has resulted not only in profit to the society, but in a reduction of the price of coal to the public. In addition to this branch, there are other branches for dealing in wine, clothing, etc.

Graphic charts show fluctuations in the volume of business done, the profit, and membership in each branch from year to year. The book is in the French language, and forms an interesting addition to our knowledge of the most important silk manufacturing centre in the world.

Sell's Directory of Registered Telegraphic Addresses, by Henry Sell, London, E. C. Price $7.50.

This is a list of telegraphic addresses throughout Great Britain. The following abstract of the contents will give an idea of the ground covered by the work; The Post Office in 1900; Post Office Regulations; Press Telegrams; Post Office Telephone, Exchange System and Regulations; London Paris Telephone; List of British Consuls in foreign countries; List of firms in Great Britain, giving postal and telegraphic addresses as well as character of business; Directory of Large Commercial Houses; Registered Trade Marks. This work can be imported through the Textile World office.

"The History of the Development of the Manufacture of Indigo." Messrs. Kuttroff, Pickhardt & Co., of New York, have recently published the English translation of the lecture delivered by H. Brunck, Ph. D., Managing Director of the Badische Anilin and Soda Fabrik, on October 20, 1900, the occasion being the dedication of the Hofmann Memorial in Berlin, erected in honor of A. W. von Hofmann by the chemists of all nations. Dr. Brunck's address is a comprehensive and sequent history of the development of the manufacture of indigo. After reading it, one cannot fail to be impressed with the persistent and undaunted determination to attain a definite object in the face of all obstacles. Dr. Brunck's history of the subject is clearly and wholly impartially presented, and there is probably no man better qualified by experience and inside knowledge of the facts, to relate them. The booklet is most attractive from a typographical standpoint.

Manual de Bachicoltura. M. Fossati e C, Carsole, Monferrato, Italy. This is a book of 185 pages, treating of the raising of silk worms and silk culture in general. It is in Italian, and is being distributed throughout Italy and France, among the silk raisers, and contains many illustrations, among them several colored plates.

Southern Cotton Spinners' Association, Charlotte, N. C. This book contains the proceedings of this association at the annual convention held in Charlotte, N. C., May 10, 1900; in addition to the proceedings, it contains a copy of the by-laws, as amended; a report of the meetings of the board of governors; also a statement of the cotton goods imports from the United Kingdom, for the year 1900.

Jenkins Bros. Valve. A catalogue of 74 pages, giving price list, description and illustration of the various valve and pipe fittings manufactured by the well-known firm of Jenkins Bros., 17 Pearl Street, Boston, Mass., and 71 John Street, New York, N. Y.

Oakes' Dyary. The Oakes Mfg. Co., 58 Stone St., N. Y. We have received the May issue of this publication, which, as stated on the first page is published every little while at 58 Stone St., New York City, for the amusement, or

the instruction of the dyer who dyes, and the buyer who buys dyes.

It contains numerous amusing illustrations and paragraphs, as well as information in regard to the well-known dyestuffs and chemicals handled by the publishers.

—Excelsior Knitting Machine Manufacturing Co., Allentown, Pa., have sent us a useful and ornamental souvenir in the shape of a combination monthly calendar and thermometer, attractively mounted in leather for office use. It will be sure to find a place on the desk of every knitting manufacturer fortunate enough to receive one.

Dyestuffs. Wm. J. Matheson & Company, Ltd., New York. This is a neatly bound volume of the Dyestuffs, and puts the files of the periodical in convenient form for reference.

New Color Cards Received.

Alizarine Colours on Cotton Yarn. Victor Koechl & Co., 142 Hudson, St., N. Y. This elaborate color-card shows 408 samples of cotton yarn dyed with various shades with the Alizarines; complete directions for dyeing, also formulas for each shade are given. The samples are mounted on very durable cards enclosed in a case. This card should be in possession of every dyer of cotton yarns.

Blue on Cotton Cloth. Wm. J. Matheson & Co., Ltd., New York. This card contains five samples of blue on cotton cloth, dyed with Diamineralblau R, Bleu Diamineral R, and Diamineral Blue R.

Pluto Black C R. Farbenfabriken of Elberfeld Company, New York. This sample sheet shows two samples of cloth, colored with Pluto Black C R, which is a new dyestuff for cotton, half-wool and half-silk.

Fashionable Shades on Loose Cotton. Farbenfabriken of Elberfeld Co., New York. This card shows 32 shades on loose cotton, dyed with sulphide colors only, and without any after treatment. Formulas and directions accompany, the same.

Fashionable Shades on Woolen Cloth. Farbenfabriken of Elberfeld Co., New York and Boston. This card contains 180 beautiful shades colored on woolen cloth. They have been dyed for one hour at a boil with the addition of Glauber's salts, sulphuric acid, and bisulphite of soda. Formulas are given for each shade with directions for dyeing, and those colors are indicated which have superior qualities as to fastness to light.

New Victoria Blue B. Farbenfabriken of Elberfeld Company, New York and Boston. This is a color card showing six patterns of cotton and half-wool, colored with New Victoria Blue B. This dye has been issued in response to repeated inquiries for a blue more suitable for color discharge styles with tin, than those now in use.

—Cachou de Laval R. Messrs. Sykes & Street, New York. This card shows twelve samples of cotton yarn colored with Cachou de Laval R. The shades vary from a Light Stained to a Dark Drab, and show the fine differences of shade that can be secured with this dye.

Instructions and formulas for dyeing accompany each sample.

—Farbenfabriken of Elberfeld Company, New York. This card shows 104 very bright, attractive shades on cotton. Directions for dyeing are given in English, French and German. Formulas for the first bath accompany each shade.

—Alizarine Green, K. 2 B. Farbenfabriken of Elberfeld Co., New York & Boston. This card shows four samples of cotton yarn colored with Alizarine Green K 2 B, formulas and directions for dyeing.

—Anthracene Acid Brown V. William J. Matheson & Company, New York. This card shows samples of wool colored with Anthracene Brown V, which is dyed in the same manner as the other brands of this class of dyes, and yields full, reddish brown shades.

Acetylene Gas.

Acetylene Gas is generated from Calcium Carbide by bringing water in contact with the carbide.

Calcium Carbide is made from lime and coal in electric furnaces, where the mixture is subjected to a very great heat, the product being the commercial Calcium Carbide of today. It is a hard, porous material, unchangeable in dry air, but when subjected to moisture gives off Acetylene Gas.

Carbide is put up in metal drums to keep it dry and for convenience in shipping.

Acetylene Gas as an illuminant is a perfect artificial light. It is soft, clear and white; resembling sunlight more nearly than any other light, and consequently is best adapted for showing colors and tints of all classes of goods.

The burner ordinarily used in burning Acetylene Gas is ½ cubic foot—which means, that it will burn ½ foot of gas every hour, therefore if a burner is left open the damage from this gas is one-twelfth that of ordinary gas, and when burning, there are no noxious products, no odor and no smoke.

The cost of this gas at present price of carbide is equivalent to common gas at 60 cents per 1,000 cubic feet for the same candle power of light; and is also very much cheaper than electricity.

Factories having rooms with a considerable number of gas lights, require a smaller number of burners for the same amount of light if Acetylene Gas is used, which reduces the cost still more. This varies according to the number of lights used in a room, and in many instances has been reduced over 40 per cent. in number and the room better lighted than with the old gas.

A very perfect generator is made by L. J. Wing, 95 Liberty St., New York. It is strongly built of heavy galvanized sheet steel, and is a very simple form of the drop or dump generator. No valves enter into its construction save the cleaning valve.

There is an internal revolving wheel mechanism requiring the use of small lump or ground carbide.

One of the most desirable features claimed is, that there is no chance for leakage, there being but one valve, and the removable top having a water seal.

Mercerizing Cotton.

Recently a process was patented in Germany for giving mercerized cotton an after treatment, consisting of wetting out and re-drying under tension. A writer in Ost. Wollen und Leinen-Industrie states that he has carefully tested yarn treated by this process. He used yarn mercerized by two different processes, and in both cases he found the results to be unmistakable. The lustre was greatly improved, but the yarn handled stiff and hard; so that the advantage on the one side was practically counterbalanced by a disadvantage on the other.

The following table shows the results of these experiments:—

MACO YARN.

	Strength.	Elasticity.
No. 100 single:—		
Mercerized	338	12.25
After treatment	360	11.9
No. 40 single:—		
Mercerized	326	10.85
After treatment	351	10.05
No. 20, 2 ply:—		
Mercerized	796	14.05
After treatment	948	10.40

On some classes of goods the reduction of elasticity would be immaterial, while on others this alteration of yarn could not be ignored. The writer concludes, however, that the process must be recognized as an improvement in mercerization which, like most improvements, has its objections as well as its advantages.

New Contracts.

The American Bridge Company have the following contracts under way:—

Four bridges for the Province of New Brunswick, Canada. There will be required four 63-foot, riveted spans, one 150-foot, through pin connected span, one 200-foot deck pin connected span, and one 80-foot deck pin connected span. The Kalgoorlie Electric Power Company, Kalgoorlie, Australia. This plant consists of an engine house, 43 feet by 159 feet, with a lean-to 17 feet by 40 feet, and a boiler house 41 feet by 132 feet. The steel work for two deck plate girder spans, and for strengthening two bridges on the Jamaica, West Indies Government Railway. The bridge over the South Shrewsbury River at Seabright, N. J. This contract includes furnishing cylinder piers and abutments, four deck plate girder spans, and one draw span 220 feet long. The bridge will have a 30-foot roadway, and two seven-foot sidewalks. The contract is with Monmouth County, N. J.

The American Bridge Company will make quite an elaborate building exhibit at the Pan-American Exposition, furnishing two buildings each about 60 feet in width, about 150 feet in length. One of the buildings will be of extremely plain construction, being designed for use as a manufacturing plant. The second, however, will be of ornamental design, such as would be used for freight depots, street car barns and that class of structures. They will also make an extensive exhibit of parts of large bridges.

Burt Manufacturing Co.

The Midvale Steel Co., Philadelphia, have installed eight Burt exhaust heads in the last four months, and the Singer Mfg. Co. have purchased a Cross Oil Filter for their power house from the Burt Mfg. Co., of Akron, Ohio.

Re-Organization.

The Oldham, Eng., Chronicle, in its issue of April 6th, 1901, speaks as follows of the re-organization of the well-known textile machinery builders, John Hetherington & Sons, Ltd:—

A fortnight ago we published particulars of a new financial scheme drafted by the directors of Messrs. John Hetherington & Sons, Ltd., and submitted to the shareholders for approval. This scheme which will increase the capital from £185,000 to £245,000 by the creation of 60,000 new shares of £1 each, has been adopted by the shareholders and we are informed that the bulk, if not all, of the capital asked for has already been raised. No stone is to be left unturned to make the firm sound and strong financially.

The board of directors of Messrs. John Hetherington & Sons, Ltd., has been considerably strengthened by the inclusion of three influential business men, well known in Manchester—Mr. Whitby, a shipper; Mr. Abercrombie, stock and sharebroker; and Mr. Hindle. The appointments appear to have given general satisfaction to the shareholders, for whom we believe there are brighter days in store.

The United Indigo and Chemical Co., Ltd., Opens an American Agency.

The United Indigo & Chemical Co., Ltd., of Manchester, Eng., among the largest manufacturers of dyewood and tanning extracts, aniline and alizarine colors, indigo product and calico printers' supplies, in that country, has arranged to import direct into this country all of the above line of dyestuffs and colors, including indigo, cutch and gambier. Fred W. Dixon, late selling agent with John D. Lewis, Providence, R. I., who is well known to the textile and leather industries, has been engaged as general manager for the United States and Canada, and he will be assisted by a first-class corps of salesmen. A large warehouse in East Boston has been leased, where the company carries large stocks of its specialties, enabling them to fill orders promptly. Laboratories for testing and matching colors are also being installed. The headquarters of the company in this country are at 176 Federal Street, Boston, Mass., where a fine suite of offices has been taken and where Mr. Dixon and his assistants will be pleased to meet their many friends among the trade at all times.

John J. Keller & Co.

A new branch of John J. Keller & Co., dyestuffs, has been opened in Providence, R. I., at 56 South Water Street, under the management of Mr. Arthur Turnbull, associated with Mr. G. W. Gleason, formerly of their Boston office.

—The Gillette-Herzog Branch of the American Bridge Company will furnish the steel work for the large steel building to be shipped to the Montezuma Copper Company, at Nacozani, Mexico.

A New Woolen Machinery Firm.

W. H. Hassett, who has been for a number of years connected with the Atlas Foundry & Machine Co., both before and since its re-organization, has recently severed his connection with that concern and organized the American Machine Co. The new company will build and sell a line of machinery for the preparation of wool stock, including double cylinder Parkhurst burr picker, single and double burring machines and feed rolls, Hassett's Improved side drawing machines for first and second breaker cards, with or without bank creels, Tindell's improved wool, cotton and hair mixing pickers, also automatic card and picker feeds. Burr picker and machine brushes will be kept in stock and supplies promptly attended to. Mr. Hassett is a practical mill man, and his long connection with this special line of machinery has made him familiar with the wants of manufacturers. They will give special attention to all repair work on burring rolls, burr pickers, etc., and intend to carry duplicate parts in stock for quick repairs. Their location is on Bellgrove Drive, Kearney, N. J., which is just outside of the limits of Newark.

Sizing Compounds.

The Arabol Manufacturing Co., 155 William St., New York, are among the largest manufacturers of sizing compounds, softening oils, softeners, etc. They are well equipped for producing strictly modern compounds, based upon the best practical and scientific experience that can be obtained. Their facilities for supplying the needs of mills as regards sizings, softeners and finishing compounds for warps and fabrics are first class. When ordering sizing, etc., a full explanation is necessary as to the class of goods, also whether the water is hard or not, and the kind of "feel" required; in order to be sure of obtaining the very best goods, for any particular work.

They recommend their Sizoleum and soluble softening oil mixed with either corn or potato starch for colored warps. The former is also adapted for use on printcloth warps, sheetings and domestics. No tallow should be used with it. The Arabol Gloy G is adapted for either light or heavy sizing of cotton warps and is especially recommended for use on export goods, such as china shirtings, drills, denims, coarse and medium goods, etc. Gloy G strengthens the starch both in volume and adhesive power, giving elasticity and tensile strength. The warp sizes AA and AAA are adapted for medium and fine yarns; they also may be used on colored warps. They give smooth finish and good weaving qualities. The soluble softening oil is one of the finest softening or sizing oils on the market. It is superior for use as a softener, and is said to be much superior to tallow. The manufacturers state that the softening oil is always reliable and summer or winter remains in sweet condition, that it gives a smooth finish to the warps, the threads divide well in the lease rods, and that the cylinders of the slasher keep clean as a penny. It is said to be neutral, easily handled and most suitable for strong or close woven goods, such as corduroys, velveteens, sateens, twills, umbrella cloth, cambric warps, etc.

The Arabol Company, 155 William St., New York, will be pleased to give information on this subject to any parties interested.

From Lowell to Springfield.

The Whittier Cotton Mills have removed their general office to Springfield, Mass., from Lowell. All communications hereafter should be addressed to Springfield. This company's mills are at Chattahoochee, Ga.

Personal Experience.

At the recent meeting of the New England Cotton Manufacturers' Association, in Boston, Mr. C. P. Brooks received many expressions of approval from mill men as to the work that the American Correspondence School of Textiles is doing; he states that mill agents and superintendents are noticing the distinct improvement in the work of those men in the mill who are taking the courses of instruction with the Correspondence School, and are advancing such men to more responsible positions on account of their increased knowledge and ability.

A Connecticut mill agent recently stated to Mr. Brooks that the work in his picker room had been improved 100 per cent. by his boss carder applying the knowledge gained from the picker lessons of the Correspondence School, and he has since promoted this carder to be a superintendent.

The book "Personal Experience," recently published by the School, gives many other instances of a similar character and may be obtained by application to Prof. C. P. Brooks, Director, New Bedford, Mass.

Pan-American Exposition.

In order to handle the increased traffic which is expected on the Buffalo Railway Co., during the Exposition, a large power plant is being constructed.

One of the features of this plant will be the installation of a large mechanical induced draft to produce the draft, and handle the gases of combustion from a boiler plant whose nominal capacity will be in the neighborhood of 2500 horse power.

The fan in question, built by the Buffalo Forge Company, of Buffalo, N. Y., is 24 feet in diameter, of the three-quarter housing up-blast type, and rigidly constructed of steel plate, braced and stiffened with angle irons. The fan is designed as an exhauster with an inlet nine feet in diameter and will be driven by belting to a Buffalo 13 by 12 Horizontal Centre-Crank Class "A" Engine. In order to keep the bearings cool, a constant circulation of water will be maintained around them. The short stack into which the fan will discharge, will be of sheet steel.

This particular plant illustrates very nicely some of the inherent advantages of mechanical induced draft. For instance, there is no necessity for a tall, heavy chimney, and again, since the whole construction is of steel plate it can be constructed and installed in a minimum

length of time. Once in place, such an apparatus provides complete control over the conditions of combustion and renders the performance of the boilers independent of those conditions of weather, wind, temperature and the like, which influence plants served with chimneys. The intensity of the draft is in proportion to the fan wheel velocity and hence can readily be altered to suit varying conditions.

Atlas Foundry and Machine Company.

L. F. Dickinson, for a long time associated with the late S. R. Parkhurst, proprietor of the Atlas Manufacturing Company, of Newark, N. J., in the building of the well known Parkhurst burring machinery, is now with the Atlas Foundry & Machine Company, successors to the Atlas Manufacturing Company. This company is building a large, well equipped factory at Belleville, N. J., just outside of Newark. In addition to the Atlas Manufacturing Company's specialties, a line of rubber machinery will be manufactured. Mr. Dickinson had a long experience in building machinery preparation of wool, and this will undoubtedly prove of great advantage to the new concern. They propose to keep fully abreast with the times, and adopt the latest and most improved methods. They wish to call the attention of the trade to their card balling machine; a number of these machines are now in operation in the mills of the Root Manufacturing Co., Cohoes, N. Y. Their new automatic wool duster on the market, which has lately been brought out, is highly spoken of.

H. G. McKerrow & Co.

Boston, Mass., May 2, 1901.

The partnership heretofore existing between H. G. McKerrow and Thomas A. Leigh of Liverpool, England, under the style of H. G. McKerrow & Co., was dissolved by mutual consent on December 1st, 1900. The business of that firm is now in process of liquidation.

The business has been since that date and is now carried on by H. G. McKerrow under the style of H. G. McKerrow & Co.

H. G. McKerrow.

—The Pencoyd plant of the American Bridge Company, shipped during March, 7339 tons. We believe this is the largest shipment ever made by any bridge shop in the world.

Protection Against Fire.

The International Sprinkler Co. is continuing in the good work of fire protection on an ever increasing scale. They report about 30 contracts for sprinkler installations, taken in the past three months, which is a record that speaks well for any concern in this line. The excellence of this Company's devices and engineering and contracting work is becoming more and more widely known, and they are reaping the benefit of their high standard of business methods.

Among their contracts recently taken are for the large, new building of J. B. Lippincott Co., the large publishers of Philadelphia: Reiling, David & Schoen; Anchor Duck Mills; Roanoke Cotton Mills, Roanoke, Va.; Lever Bros., Ltd.; the International Soap manufacturers in their large Philadelphia works; J. G. Brill Co., the car builders, Philadelphia; Edna Cotton Mills, Reidville, N. C.; a second order for the Richmond Locomotive and Machine Works, Richmond, Va.; the large new establishment of Marks Bros., the Philadelphia dry goods merchants; Lynn Cotton Mills, China Grove, N. C.; Standard Steel Works, Burnham, Pa.; and Diamond Silk Co., York, Pa. The company is doing an extensive business in Canada through their representatives, Messrs. W. J. McGuire & Co., Toronto, and Montreal.

The International Company is also paving the way for securing its proportion of the business throughout New England through their representatives the Rhode Island Engineering & Supply Co. of Providence, R. I. This is an active and well to do concern who have just completed extensive shops for cutting and handling pipe and fittings at Providence, R. I. President Mills was the manager of the New York Branch of the Crane Co. of Chicago in which capacity he managed a business for them of over a million dollars a year. They are thoroughly experienced sprinkler people and with their clientele in New England, facilities and general capacity for such line of work, it is safe to predict that they will get their share of the future sprinkler business in their section hereafter.

The International devices have become so well known that any company that has the use of them is sure to get their proportion of both wet and dry installations.

Agent for Pittsburg District.

Mr. A. L. Schultz, formerly President and General Manager of the Schultz Bridge & Iron Company, Pittsburg, Pa., has been appointed to take charge of the Operating Department of the American Bridge Company, covering the Pittsburg District, comprising the Keystone, Pittsburg, Schultz and Shiffler plants at Pittsburg; the Wrought Iron Plant at Canton, Ohio; the New Columbus Plant at Columbus, Ohio, and the Youngstown Bridge Company Plant at Youngstown, Ohio.

The Sturtevant Fire Causes Little Interruption.

The fire which visited the works of the B. F. Sturtevant Co. of Jamaica Plain, Mass., on Sunday the 14th of April, proved to be far less disastrous than was first reported. Only the engine and electrical departments were injured. The power plant was started up with but a single day's delay incident to renewing belts damaged by fire, and the entire blower, heater, forge, galvanized iron and shipping departments with the foundry, pattern shop, etc., were in full operation on that day and the shipments going forward as usual. No valuable office records were lost, the most serious damage occurring in the advertising department, where a large amount of printed matter was destroyed. Fortunately, however, an entirely new general catalogue was in press at the time and copies were issued on the 16th in time to meet all demands

for information. New offices were established on Monday morning in a nearby building and Monday noon the business was running as usual. With these facilities at its disposal, there is no likelihood of any delay in shipments except such as may occur in the electrical and engine departments, and arrangements are already made for handling this work.

Paint in the Dye House.

All metal and woodwork in the dye house should be cleaned and painted from time to time; this adds to their life and is a great preventive of spots and stains in the finished goods. The cleanliness of all apparatus in the dye house is a matter of importance. In painting any apparatus it is usually best to apply a thin coat of paint. The following coat or coats should be of such consistency as to enable the painter to apply the greatest amount of oil in each coat, for oil is a grand preservative of wood and metal work. This, says the Dyer and Calico Printer, is applicable to the repainting of iron or steel as well as wooden surfaces —with this exception, that the first coat when repainting iron or steel surfaces will not need to be quite as thin for wooden surfaces. Keep the walls and ceilings of the shop well lime-washed; this adds to sanitary efficiency of the shop, while at the same time it makes the shop much lighter and therefore much easier to work in. The expense is not great and is saved by the better work that can be done in a well lighted shop than a badly lighted one.

Patent Decision.

A decision in the patent case of John Bracewell vs. the Passaic Print Works has been rendered by the U. S. courts, dismissing the bill. The patent in dispute related to an improvement in aniline-black resists, and the decision of the courts gives any one the right to use the process.

It is understood that Col. Bracewell spent much time and money during a number of years in perfecting the process which, it now appears, consisted of nothing new or novel. A curious feature of the case is the humorous remarks indulged in by the court in rendering the decision. The following is an example:—

"The most learned chemists in the land differ radically and almost acrimoniously upon every vital point and not infrequently those enlisted upon the same side are not in perfect record. Were the patent taken bodily from Holy Writ, no more antagonistic dogmas and warring theories could be deduced therefrom. Unless the complainant can furnish a reliable chart and a more accurate compass, he can hardly expect the court to steer a straight course through a 'sunless sea' of zinc, coal tar and aniline black."

This is rather unusual phraseology in a calm decision relating to chemical reactions of drugs, dyestuffs and textile materials.

Economy of Fuel.

The following letter from the Elmira, N. Y., Water, Light and R. R. Co., who have installed a forced draft apparatus consisting of our Buffalo steel plate 80-inch fan connected with a 5 by 5 Buffalo Class "A" engine, explains itself:

Buffalo Forge Co., Buffalo, New York.

In reply to yours of the 2d inst. will say that we are very much pleased with your direct connected fan outfit for forced draft purposes at our lighting plant. Our saving on the first month's run with this apparatus in use, amounted to 175,000 lbs. of coal, and on the test for increasing the capacity of our boilers, we found that with a fan, 250 H. P. water tube boiler developed on a continuous run of ten hours, a little over 600 H. P., and while we do not advocate forcing the boilers to any such extent, it simply shows what can be done in this line in case of necessity. A. E. Walden, Supt.

This plant serves two 250 H. P. boilers.

Curious Conditions Changed by Quiet.

When jaded by the cares and worries of this life, when filled with a spirit of unrest, the best thing imaginable for the afflicted to do is to hie himself to new scenes—to the primeval wilds, in that part of New England known as the fishing regions, there to enjoy a period of absolute quiet.

The enjoyment, the complete retirement in which one finds himself, is the best health restorer you can find. The manipulation of hooks, nets and lines, the sight of a big, wary fish, anxious for a tussle, and the excitement attending the landing of one of these fine fellows, will drive away the blues, and every moment of the spring vacation is one of intense enjoyment.

The regions, or sections, which offer allurements to the early fisherman are several, but the most prominent and conspicuous are the Moosehead and Rangeley regions, though many sportsmen prefer the Allegash region or the territory in Washington County, Maine, while others single out Lake Winnipesaukee or Memphremagog, or Sunapee or Champlain, or, perhaps, some one of the streams or lakes of the Adirondacks is the choice for the spring sport.

The Boston & Maine Railroad reaches every section in which spring fishing is a predominant feature, and the pamphlet, "Fishing and Hunting," gotten out by its General Passenger Department, whose offices are in Boston, Mass., is chock-full of interesting information which every sportsman should read, and a two-cent stamp sent to the above address will procure it for you.

Increasing the Lustre of Silk.

A French process recently brought out for increasing the lustre of silk consists in treating the material in a muriatic acid bath, which has a tendency to shrink the fibre. The goods are then thoroughly rinsed while under tension, and it is claimed that this process increases the lustre materially.

Cling-Surface at the Pan-American.

The Cling-Surface Mfg. Co., of Buffalo, N. Y., have space in the Pan-American Exposition, Machinery Building (Belting Department) where they will have a very interesting exhibit of running belts. Two belts, exactly similar, one filled

with Cling-Surface and one untreated. They will show the former running very slack yet carrying more load than the latter running tight.

Despite the dullness of the cotton machinery trade, H. G. McKerrow & Co. report that they have on order a large amount of Tweedales & Smalley's machinery.

Upwards of a hundred speeders, besides cards and drawings, were due on their order books April 15th. They have recently shipped to the Conanicut Mills the necessary parts furnished by Messrs. Tweedale & Smalley to lengthen out some fine frames.

The New American Agency.

There is so much Hetherington machinery in operation in the United States and Canada, that the recent change of agency is a matter of much interest to a large number of cotton manufacturers.

A rumor has gained some currency that the Hetheringtons were to liquidate their business and retire from the American field. This is very far from the facts of the case; on the contrary, the firm of John Hetherington & Sons, Ltd., of Manchester, Eng., since the death of one of the firm, has been reorganized and a large amount of fresh capital has gone into the business which, under vigorous management, will be exploited with unabated energy, both at home and abroad.

The sole importation for this firm for United States and Canada is now in the hands of Mr. Stephen C. Lowe, of New Bedford, Mass., widely known through his mill supply business. New offices have been opened especially for the Hetherington agency in the Brewer Bldg., Boston, and Mr. Lowe will give his personal attention to this business, assisted, for the present, by Mr. A. Joynson of the English house.

In the short period that the new agency has had charge of the Hetheringtons' business, they have already taken some good orders for new work, besides the repeat orders which so frequently follow the introduction of Hetherington machinery.

They are making a special point of promptness in filling orders, which their extensive facilities permit them to do with celerity, instanced in a case which was recently brought to our attention. On April 5th, an order for combers was given to Mr. Lowe, and on the 9th inst. (four days later) the machines left Liverpool and will probably be in operation in the American mill in about three weeks from receipt of order.

The Hetherington line embraces all kinds of machinery for opening, preparing, spinning and doubling cottons, cotton waste, woolen, etc. They make a specialty of combers, of which they were the original, and for many years the sole makers, and to which they have applied many valuable improvements. The sales of the Heilmann Comber exceed all others; 3000 have been supplied to the United States alone, which may be considered a striking proof; this machine is, moreover, the one which has been most extensively supplied to the fine spinners, both in Great Britain and abroad.

They have recently brought out a new carding engine, which is illustrated and described at length elsewhere in this issue.

Foreign Trade.

The American Bridge Company report their foreign trade as developing very rapidly. Within the past few days they have received a contract for 20,000 tons of bridges for the Guayaquil & Quito R. R. Company in Ecuador, South America, and a large group of buildings for the Cananea Consolidated Copper & Silver Mining Company of Mexico; and also several large contracts for manufacturing buildings to be shipped to Australia, and a large railroad bridge to go to the Sandwich Islands. It is also announced that their tender for a large foreign contract exceeding in size anything which they have taken has been accepted, and that one of their engineers sailed this week to complete the arrangements. The officials of the American Bridge Company decline to say anything about this matter until the contract is definitely consummated, but admit the facts substantially as above stated, that it is the most important foreign contract that they have yet taken.

Yarns for Knitting and Weaving.

J. Broadbent & Son, Unionville, Conn., are very well fitted up to supply the knitting and weaving trade with woolen yarns or wool spun cotton yarns. They have three sets of cards, and are located where manufacturing expenses are low, and consequently can quote low prices. Their plant is equipped with cotton openers and lappers for cotton yarns on wool spun system. They make a specialty of doing custom work for mills furnishing their own stock and carefully study the requirements of the knitters and weavers.

Green Economizers.

The Boston Elevated Railway Co. have ordered two more Green Economizers for their Lincoln Wharf Power Station and also another one to be installed in Charlestown Station which will then double the present economizer capacity there. The contract was placed with the Green Fuel Economizer Co., the sole makers in the U. S., through their Boston office at 53 State Street. The Ponemah Mills, Taftville, Conn., have also bought a Green Economizer.

—The Gillette-Herzog Mfg. Co. has contracted to build a Beet Sugar Factory at Logan, Michigan, for David Eccles; this includes a main building 60 to 75 feet wide and 275 feet long, a boiler house roof 42 by 101 feet, a lime kiln building 41 by 84 feet and a warehouse roof 52 by 144 feet.

—The Rodney Hunt Machine Company of Orange, Mass., has offered to the Lowell Textile School one of its well known fulling mills, also a cloth washer for the finishing department of the school. The other machines necessary for this department are expected.

—The Manchester Mills, Manchester, N. H., have placed an order with the American Moistening Company, Boston, Mass., for one of their Aerophor Fabric Dampeners.

New Textile Fibre.

The Deutche Wirker Zeitung says that the palm leaf has recently been utilized for textile material. New textile fibres are continually being brought to the attention of the public, only to sink back into obscurity after a short time. It is said, however, that the fibre can be extracted easily from the palm leaf. Where this is done by machinery, the leaves are thoroughly steeped in water or an alkaline solution. The material is then allowed to ferment, and afterwards is thoroughly dried, and then squeezed or ground between flat iron plates and rollers to separate the fibres. By this process the fibre is extracted from the pulpy mass of the plant, and according to the duration of the retting process is the fibre a light or dark color. It is said to possess great strength, and to be suitable for many industrial uses.

Where machinery is not available, the extraction is carried on by a chemical process. The leaves immediately after cutting are thoroughly dried, and then immersed in a solution of caustic soda, and allowed to ferment. When the fermentation has reached that point where the fibre can be easily separated from the rest of the plant, the material is placed in a water bath and allowed to remain for about twenty-four hours. Finally, it is treated to a bath composed of equal parts of cocoanut oil, kolophonium, and then to a sulphuric acid bath. The material is then rinsed in clean water, and the fibres are found to be separated from each other, and to have a dry, clean appearance.

Where a card is used for extraction of the fibre, the leaves are carded as soon as taken from the trees, which makes them soft and pliable. They are then passed through the fermentation process and squeezed between rolls. The difference between the last named process of extraction and the two first, consists in the fact that in the last one the raw fibre, instead of the leaves, is treated in the process of retting.

Continuous Bleaching.

A continuous process for bleaching cotton piece goods, proposed by a German, of Stockport, consists in first treating the goods to a bath of dilute muriatic acid, and letting them stand for several hours; after which they are extracted and run into an ordinary continuous piece dyeing machine, where they are treated with a dilute hot alkaline bath. The goods are then washed and run through a chloride of lime solution. After coming from this solution, they are carried continuously through a chamber in which steam and acetic acid have been introduced, where the chlorine of the bleaching solution is liberated and the lime converted into acetate of lime. The goods are then washed and dried.

Increasing Lustre of Dyed and Mercerized Cloth.

The L'Industrie Laniere describes a method recently patented, for heightening the lustre of mercerized and colored cottons. After the cloth has been dyed and mercerized, a solution consisting of a fat or resin (or a mixture of the two), in ether, is applied to the goods, which are then well brushed. A mixture of 20 parts yellow amber and 80 parts turpentine is said to give good results. The turpentine penetrates the fibre quickly, and the resin is thoroughly incorporated with the texture; and at same time the coloring matter is said to unite with the resin.

The process is recommended for cotton velvet, plush, twine, moleskin, etc.

Lustre on Short Staple Cotton Yarn.

A process for imparting to short staple cotton yarn and fabrics, the lustre which has been obtained by mercerization of cotton yarn and cloth made from Egyptian and Sea Island cotton, has been patented in France.

It consists of mercerizing with the usual alkali liquor, to which is added copper oxide of ammonia, and an after-treatment with concentrated acid, after which the material is well washed. The Deutsche Tuchhalle says, however, that the lustre is but slightly superior to that produced by the ordinary mercerizing process, while there is great danger of injury to the staple from the use of the copper oxide of ammonia.

Bleaching Vegetable Fibres.

A process of bleaching vegetable fibres, recently patented in France, consists in the introduction of carbonic acid gas into the lime solution. The acid is either first mixed with concentrated chloride of lime, the resulting mixture being added to the bleaching bath; or the acid is introduced direct into bleaching solution. One claim made by the patentee is simply for the neutralization of bleaching solutions with carbonic acid.

Mutual Benefit Association.

The 69th annual dinner of an association formed to render pecuniary assistance, medical and surgical attendance to aged and necessitous members, their widows and orphans, was recently held in London, Eng.

The members come from the linen and woolen drapers', silk mercers', lacemen's, haberdashers', and hosiers' trades.

The association possesses a number of cottage homes at Hendon, for which an effort is being made to provide a permanent endowment fund of £20,000. Between £3000 and £4000 has already been subscribed towards this object. The institution disburses over £7000 a year in relief to sick, aged, and unfortunate members. It has now over 200 pensioners on its lists.

During the past year nearly 400 applications for assistance came under the consideration of the board, and in no case was help refused, while in the same period over 1000 members availed themselves of the benefits of medical advice and attendance, which cost upwards of £1200.

Allowances are made annually to 88 widows of members, amounting to about £2200. The total number of cases assisted by pecuniary aid since the foundation of the institution is 9350, representing a sum

of £188,000. At the annual dinner the chairman urged the necessity for every endeavor being put forward to keep its benevolent institution in a flourishing condition. Their society was especially deserving of aid in that it dispensed its charity silently and without the voting system. He, however, felt that the younger members of the trade did not come forward as they should to support this charity. They should remember that for the small sum of one guinea a year a subscriber might insure himself against want for the whole of his life.

New and Old Methods of Manufacture.

We have received a circular issued by a custom woolen mill in the West, from which we make the following extract to show our readers that old methods of manufacture still survive, at the present time when the modern factory system has reached such an advanced state of development:—

"It is an old, old adage, and has never been contradicted, which says, 'Wherever the hoof of the sheep is found there is gold.'

"I make a specialty of Carding Wool. Satisfaction guaranteed. Always wash your wool before sending it to the factory, because I cannot card dirty wool. I don't care how many burs are in it, but the wool must be washed clean. Use a little soap and warm water to wash wool. Don't use hot water, it will ruin the wool.

"I card wool for ten cents per pound, parties furnishing their own oil or grease; it takes one pound of grease to every ten pounds of wool. I charge one-fourth of the wool where parties don't pay money.

"People living at a distance can have their wool carded by shipping it to me by express or freight, but always write me about every shipment you make, and mark your own name on every package or sack as well as mine so I can tell who it is from. I always furnish shipping tags on application. It is best to send small packages by express as it obviates delay of slow freight. Always send sheets or blankets to wrap rolls in, tow sacks spoil them."

A New Flooring Material.

The Deutsche Farber Zeitung gives an account of a material called Xyiolith, which is being used extensively in Germany for various purposes, principally for flooring.

It is composed of a mixture of sawdust and a mineral combined under great pressure. It comes in the form of square blocks from four to nine inches thick, and can be sawed, planed, bored, or worked in any form desired. It is said to be fire-proof, very durable, and is not liable to rot, or absorb moisture.

The writer states that it is a good non-conductor of heat, and has been used not only for flooring but also for roofing material, and for covering inside walls and ceilings. It is said to be well adapted for stair treads and friction pulleys. For the last named purpose it is said to be particularly well suited, as it works equally well whether the air is damp or dry.

Powder for Soldering Steel.

Heat 25 parts borax and mix with same weight of fine steel filings; then add 20 parts of resin and 7 of sal-ammoniac. This mixture, while still hot, is poured on a steel plate and left to cool; then it is reduced to a powder and kept in a tight bottle until wanted—La Revue Technique.

Dye Tubs.

Time was when it was the almost universal custom to let the vat into the ground, leaving but a little of it above. This system was bad, and often led to accidents by the workpeople tumbling in. Then the contact of the probably damp earth rapidly led to deterioration, and soon the vat became leaky and unusable, and the only remedy was to put down a new one. Now, says the Dyer and Calico Printer, the custom is to build the vat a little above the floor, so that no wet from that shall affect the vat in any way, and this is certainly the better way, for then every part of the vat is accessible for inspection, and if anything goes wrong it can be easily put right.

Fly Wheel Explosions.

About ten years ago an epidemic of flywheel explosions began, and in the three years 1892, 1893, and 1894, it prevailed to the extent of about one large wheel a month, not to mention those under twelve feet in diameter. These wheels, without exception, were of cast-iron, and of all sorts of designs and qualities of metal; and most of them went to pieces from overspeed, commonly known as "racing." In the following years, down to the present time, the casualties have been decreasing, and Chas. H. Manning stated in a recent lecture that he had not noticed more than one or two since the beginning of last year.

Examination of Asbestos.

An engineer, A. J. Jacobsen of Copenhagen, has recently completed a series of experiments to determine the relative value of the different grades of asbestos. He paid particular attention to determine the resistance to high temperatures. He submitted various samples to the temperature of 210 degrees for sixty-four hours, and found the different grades to be affected very differently under these conditions. The experimenters concluded that better results in the examining of asbestos could be attained with a microscope, than by chemical processes. These experiments were made in the laboratory of the Government Railway of Denmark.

The Revue Technique cites the case of an ocean steamship which made four round trips between Glasgow and New York; the pistons of the engine were packed with asbestos, and required no attention during the time occupied by these four trips, and at the end did not appear to have suffered materially.

—The increase in demand for the Hurricane Dryer has necessitated the operation of the works at 6721 Germantown Avenue, Philadelphia, night and day.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Gaylesville. We have been advised by A. D. Hudson, that company has not yet been incorporated to operate the new cotton mill here. A. B. Russell and J. E. Chesnut are associated with him in the enterprise. They contemplate making yarn and sheeting.

—Connecticut, Willimantic. M. Pollack & Co., 40 E. Houston Street, New York, have leased the upper floor of the Morrison Machine Shop and will install machinery for manufacturing cotton thread.

—*Georgia, Cartersville. Application has been made for incorporation of the Cartersville Cotton Mill, with capital stock of $50,000, privilege of increasing. Judge J. W. Atkin, J. A. Stover, H. E. Cary and S. P. Jones are interested in the enterprise. Details concerning the plant will be decided later.

—*Georgia, Clarksville. We have been advised by J. H. Hicks, that $20,000 has been subscribed by the citizens for the erection of a cotton mill, and that he is desirous of communicating with some good mill man who will construct and finance the enterprise and also to manage same when completed.

—*Georgia, LaGrange. A late report from the Unity Cotton Mills, of which C. V. Truitt is president, advised us that they contemplate starting operations Jan. 1st, 1902. They will manufacture duck and osnaburgs, medium weights; operating 10,000 spindles and 240 looms.

—*Georgia, Washington. Jas. A. Benson writes us that he contemplates converting a two story building into a cotton mill, but that he has as yet made no definite plan as to what character of goods will be manufactured. He is now making investigations regarding best line and will start work as soon as he forms a definite opinion.

—*Massachusetts, New Bedford. Contract has been awarded for erection of the new plant for the Soule Mills Corporation. Work will be started on construction next month. The company is considering project of operating the machinery with electricity.

—Massachusetts, Springfield. A new thread company is to be organized at this place, with capital stock of $25,000. Samuel McAuley (Windsor Locks, Conn.) and Frederick H. Maxwell (Holyoke, Mass.), are interested. Work will be started at once on erecting a factory for making all kinds of cotton thread.

—New York, Sparkill. Oscar D. Banta has started a small plant here manufacturing fish lines, elastic cord and braids.

—North Carolina, Fayetteville. The Fayetteville Cotton & Woolen Mfg. Co. has been incorporated with capital stock of $100,000, by E. W. Cooke (New York); W. L. Holt and W. M. Morgan (Fayetteville) and R. P. Gray.

—*North Carolina, Shelby. The Mary Etta Cotton Mills have been incorporated with capital stock of $25,000, by J. F. Ledbetter, J. H. McBrayer, E. L. Jenkins and others.

—Rhode Island, Norwood. John C. Whiting, who has been operating a plant at Providence, manufacturing cotton, woolen, silk and mohair braids, has moved his plant to this place, where the business will be carried on.

Enlargements and Improvements.

—Georgia, Columbus. The Muscogee Manufacturing Co., making cotton goods of almost all kinds, will erect an additional building to be equipped with 10,000 spindles. They will also build a new dye house, which will be equipped with modern machinery. About $150,000 will be expended on improvements.

—Massachusetts, Easthampton. A large dyehouse, 167x60 feet, will be built for the Hampton Company.

—Massachusetts, Fall River. An addition 160 by 70 feet, one story, for which plans have been prepared, will be built to the No. 1 mill of the Bourne Mills. All the spooling and warping machinery will be removed to new addition, when completed, making it a separate department.

—North Carolina, Charlotte. It is reported that the Highland Park Mfg. Co. will build a new weave shed to mill No. 1, and also an addition to their shipping room.

—North Carolina, Henderson. An addition 110 feet long, will be built to the present building of the Henderson Cotton Mills. It is thought that new machinery will undoubtedly be installed.

—*North Carolina, Rutherfordton. It is reported that the Levi Cotton Mills Co., which recently increased the capital stock will erect a mill, to be duplicate of the present plant.

—*North Carolina, Spray. The Nantucket Mills, previously reported having increased their capital stock to $225,000, will erect another new mill.

—Wisconsin, Janesville. New machinery, consisting of pickers, cards, spinning frames and specialties for the looms will be installed in the Janesville Cotton Mills. Forty thousand dollars has been appropriated for the improvements. Morris Cogan is the new superintendent.

Mills Starting Up.

—*Georgia, Canton. The Canton Cotton Mills, of which Wm. T. Brown is superintendent, have started production; viz:—sheetings and four yard goods.

—*Georgia, Moultrie. Operations have been started up in the Moultrie Cotton Mills. John Schofield is superintendent of this mill, which will make sheetings.

—*Mississippi, Laurel. Operations have been started in the Laurel Cotton Mills, capitalized at $250,000, of which G. S. Gardiner is president and J. T. Woodward, Jr., treasurer.

—*Rhode Island, Westerly. The Colway Mills Company has started operations in their new plant, manufacturing cotton goods. The plant in which they are located was formerly a woolen mill, but has been completely transformed for the present line of goods.

—*South Carolina, Columbia. The Capital City Mills have started up and will soon be in full operation.

—*South Carolina, Spartanburg. Operations have been started in the Saxon Cotton Mills, of which John A. Law is president. This mill is equipped with 10,000 spindles.

—*Texas, Waxahachie. The Waxahachie Cotton Mills are now manufacturing cloth.

Woolen.

New Mills.

—*New Jersey, Paterson. Abram Kamerling is president; Henry Van Haste, treasurer; Louis S. Barton, manager; Paul Van Haste, superintendent of the Paterson Wool Extract Co., recently incorporated with capital stock of $25,000 to operate the plant formerly run by James E. Daly. They will operate 10 sets cards, making all wool shoddies and extracts. A dye house will also be connected with the establishment.

—New York, Albany. The Albany Waste Co. has lately been incorporated for purpose of manufacturing cotton and woolen waste, garnetted stock and woolen rags, by P. J., James H. and George McArdle. They have leased the six-story building formerly occupied by La Rose Manufacturing Co., and will soon start work on installation of the machinery.

—*Oregon, Portland. The Portland Woolen Mills Co., reported incorporated in an earlier issue, is looking for a site upon which to erect building, construction of which will be started as soon as secured. They will manufacture goods adapted for the home market until trade conditions change.

—*Pennsylvania, Indiana. Work has been started on erection of the Indiana Woolen Mills, which it is hoped to have ready to start early in June.

—*Texas, Pittsburg. The Pittsburg Textile Manufacturing Co., capitalized at $25,000; G. C. Hopkins, president and W. C. Hargrove, treasurer, will manufacture cassimeres, dress goods, flannels and jeans. Mill will be equipped with 2 sets cards; 14 looms and dye house. They will also put in 10 sewing machines for making shirts and pants.

—Vermont, Ludlow. We understand that the necessary capital has been raised to carry through the project of equipping the silk mill building as a woolen mill. The present plans provide for the installation of three sets of 40-inch cards and 75 or 80 narrow looms. Cotton warp men's wear goods will be made. The superintendent is Mr. Charles McDougall, formerly with Ray's Satinet Mill and Charles River Woolen Co. at North Bellingham.

—*Virginia, Winchester. The Virginia Woolen Mills will soon start up their new plant. The mill is at present equipped with 2 sets cards and will start eight looms; eight more to be added shortly.

Enlargements and Improvements.

—Alabama, Newton. Thomas J. Killebrew, who has recently instaled 240 additional spindles, one mule and six looms in his cotton and woolen mill, contemplates adding sewing machines, etc., to manufacture trousers from cloth made in the mill.

—Connecticut, Danielson. Frank C. Smith of Worcester has secured an interest in the Himes Mill, recently purchased by Charles D. Chase. The mill will be started up on manufacture of ladies' dress goods, hitherto only spinning having been done. A new dye house will be built and a complete equipment of finishing machinery installed.

—Maine, Sangerville. The Carleton Mill Company, which recently installed some additional looms in the mill, will add more machinery, including a set of cards and some mules.

—Massachusetts, Chicopee. Some new machinery has been installed in the Burtworth Carpet Company's mill, which is manufacturing high grade Milton rugs instead of jute rugs for the next season's trade.

—Massachusetts, Franklin. Forty looms are to be installed in the Hayward Mill, H. T. Hayward, proprietor.

—New York, Albany. Additional machinery will be installed in the shoddy plant of William Barnet, increasing the production sixty per cent.

—Pennsylvania, Germantown. New cards and mules will be installed in the mills formerly run by J. A. Woods & Co., but now operated by J. H. Wiley, for making carpet yarns.

—*Pennsylvania, Philadelphia. The ground floor of the new five-story brick addition to the Collingwood Mills, Folwell Bro. & Co., proprietors, will be used for a finishing department, the rest of the building will be for storage.

—Pennsylvania, Philadelphia. A new four-story carpet mill, 269 by 280 feet, will be erected on Allegheny Avenue for Archibald Holmes & Son.

—Pennsylvania, Philadelphia. Two additional sets of cards have been installed in the Sciota Mills, Wm. Spink, proprietor.

—Rhode Island, Olneyville. An addition 130 by 65 feet, 2 stories high, is under construction for Guile & Waterhouse, proprietors of the Earnscliffe Worsted Mills. They will install 60 new looms in the addition when completed.

Mills Starting Up.

—*Illinois, Fairfield. The Fairfield Woolen Mills, bonded by R. T. Jones, will be put in operation as soon as the papers are recorded and returned.

—*Indiana, Peru. It is reported that operations will be resumed the first of May in the Peru Woolen Mills. Joshua Turner's name has been previously mentioned in connection with the project.

—*New York, Dryden. The Dryden Woolen Mill, recently succeeded by the Dryden Blanket Mill, J. D. Ross, proprietor and C. A. Lull, manager, is in operation.

Mills Shutting Down.

—Connecticut, New London. As soon as the present stock on hand is finished, the New London Steam Woolen Mills will be shut down, indefinitely. It is reported that the plant may be disposed of for other purposes, but should work be resumed as a woolen mill, new machinery will need to be installed.

—Delaware, New Castle. It is reported that the Knowles Woolen Company has closed the plant for an indefinite period.

—Rhode Island, Potter Hill. The Campbell Mills, James M. Scott, trustee of the Estate of John P. Campbell are being closed down, and will be either sold or leased.

Knit.

New Mills

—*Alabama, Huntsville. Contract for the erection of the W. H. Rowe Knitting Co.'s mill has been let to George B. Hinman, of Atlanta, Ga. The main building will be 250x80 feet, 2 stories. They contemplate having the mill completed by August 1st., although mention was made at first of possibly being ready to start May 1st.

—*Michigan, Detroit. The Angora Knitting Co., recently reported incorporated with capital stock of $50,000, succeeds the Crown Knitting Mills, of which George Rinke was formerly proprietor. Under the new incorporation, Carl Rinke is president and superintendent and George Rinke, treasurer. They will manufacture cotton, woolen and worsted ladies' and children's plain and ribbed hose, also half hose, in cotton, wool and worsted. A new building is being erected, in which they will install 20 new knitting machines. Expect to start up new plant about June 1st.

—*Mississippi, Laurel. The Mississippi Knitting Mills have been incorporated by E. E. Stallo, F. W. Pettibone, F. L. Denson, Edward Flanaghan, J. L. Hughes and others, with capital stock of $30,000.

—*New York, North Hoosick. The machinery is being set up in the new knitting mill at this place. They expect to start running about the first of May.

—*New York, Oswego. Fred C. Osterhout is president; Wm. L. Moore, treasurer and John Palmer superintendent of the Oswego Knitting Company, recently incorporated with capital stock of $10,000. They will manufacture summer weight underwear only, starting operations July 1st, and having 10 new machines. Steam power will be used.

—North Carolina, Shelby. Messrs. C. M. and Orlando Elam are reported interested in organizing the Lura Knitting Mill, with capital stock of $10,000.

—*North Carolina, Waco. The Waco Knitting Mill has been organized with W. A. Goode, M. D., president and M. E. Goode, treasurer, to make hosiery of all kinds. They expect to begin operations about August or September, with about 25 knitting machines. A new building is to be erected.

—*Pennsylvania, Hazleton. The Hazle Knitting Mill, in which A. L. Dunn, W. H. Kemp and H. W. Jacobs are interested, manufactures men's and ladies' light and heavy weight ribbed underwear; having 10 Nye & Tredick knitting machines, with necessary finishing machines.

—Pennsylvania, Latrobe. A new knitting mill, for manufacturing hosiery, will be started here by Fred Lowenstein, formerly of Belvidere, N. J.

—Wisconsin, Ripon. The Ripon Underwear Co., whose plant was recently burnt, are planning to rebuild, and get under way as soon as possible. They will probably put in Champion machines for manufacturing ribbed underwear.

—Wisconsin, Wausau. W. H. Mylrea is interested in communicating with parties knowing about wool knitting with a view to securing such a plant for that city.

Enlargements and Improvements.

—*Indiana, Fort Wayne. The United Knitting Mills, recently reported making addition of machinery to plant, have asked state authorities for privilege of increasing capital stock from $50,000 to $75,000.

—Massachusetts, New Bedford. It is reported that the Cornell Stocking Co. contemplates erecting a new mill.

—Massachusetts, Wakefield. A new addition, 48 by 160 feet, 3 stories high, will be built for the Harvard Knitting Mills,

Winship, Boit & Co., proprietors. An addition will also be built to front of present building for office purposes, the present offices to be then utilized as a dining-room and resting room for the employees. A new engine and boiler will also be added.

—Michigan, Quincy. The Quincy Knitting Company, of which H. A. Godfrey, is superintendent, will remove to Three Rivers. They will occupy the buildings of the Three Rivers Carriage Works, which will be enlarged and new and improved machinery installed.

—New York, Newport. An additional building, which will be equipped for bleaching and dyeing, when completed, will be built for the Newport Knitting Company, recently put in operation, making ladies' ribbed underwear.

—New York, Perry. The Perry Knitting Company has purchased additional land

and will erect a new building, 50x130, 3 stories, to be used for the press, packing and paper box manufacturing departments. The building now used for these purposes, will be converted into a storage warehouse.

—*North Carolina, Henderson. The new dyeing department of the Seaboard Knitting Mills has been completed and the company now does its own dyeing, having capacity of 500 dozen garments daily. The building is one story.

—North Carolina, Scotland Neck. The Scotland Neck Cotton Mills, manufacturers of cotton hosiery and underwear, will erect an addition to contain the knitting department, using the old building for installation of a spinning plant. New machinery will be installed. The company previously purchased all yarns.

—North Carolina, Scotland Neck. An addition is to be built to the present building of the Lockland Mills, in which they will install more machinery, doubling the present output. Mill now has equipment of 55 machines.

—Pennsylvania, Allentown. A new building, 26 by 50 feet, three stories, with annex, 12 by 14 feet, is under construction for the Clinton Knitting Mills, recently established here, and of which J. F. Thompson is superintendent. They will install additional machines.

—Pennsylvania, Danville. A large dyeing plant will be erected in connection with the knitting mills operated by Thomas West. The new building will be 40x60 feet, three stories, with an ell, one story high, 100 feet long. The product of other plants will be treated at the new dye house. Employment will be given to about 75 men. Work will be started on construction, as soon as plans have been completed.

—Pennsylvania, Philadelphia. A large four story building, 59x107 feet, will be built for the hosiery factory of Thomas Buck & Co., Jasper and York Sts. Alterations will also be made to the boiler house.

—Pennsylvania, Reading. A two story dwelling has been purchased by the Hampden Knitting Mill, which will be used for enlarging the plant. The rear of the addition, which will be remodelled, will be used for the knitting department, while the front portion will be adapted for office and storage.

—Pennsylvania, Wiconisco. Isaac Mossop & Co., whom we previously reported interested in erecting a branch mill at Tamaqua, contemplate equipping their mill at this place with a bleachery.

—South Carolina, Union. The Excelsior Knitting Mills have purchased a mill site upon which they will erect a new building.

—Tennessee, Sweetwater. The Mascot Knitting Mills are to build an addition to their plant.

—Utah, Logan City. An addition, 41 by 20 feet, 2 stories, brick, is being erected for the Cache Knitting Works.

Mills Starting Up.

—*Pennsylvania, Millheim. Chas. P. Hancock, is president; D. L. Zerby, secretary and A. Walter, treasurer of the Central Knitting Mills Co., recently organized to operate the mill of the Harrison Hosiery Company. Six new knitting machines will be installed in plant, which will be put in operation at an early date. Nothing but white half hose which will be sent to Thomas West's mill at Plymouth, to be finished, will be made.

Silk.

New Mills.

—*Connecticut, Willimantic. The Windham Silk Company is the name of the new concern which will operate a silk mill at this place. They will soon start work on installation of the necessary machinery. H. C. Murray is president; Charles Fenton, secretary and W. P. Jordan, treasurer.

—New Jersey, Haledon. The Cedar Cliff Umbrella Co. has been incorporated with capital stock of $10,000, by Ernest B. Rubsmen, A. Spengeman, Henry Eppelsheimer and Frank A. Dillingham. They will manufacture all kinds of fabrics used in making umbrellas, in addition to canes, handles, etc. The principal office is at Rip Van Winkle Avenue.

—New Jersey, Paterson. The Hawthorne Silk Company has been organized by Dwight Ashley, Jr., Paterson, Josiah Bailey and Allen C. Ashley, with capital stock of $100,000. They will manufacture, sell and buy, silk, wool, cotton and other threads, cloths, etc. Principal office will be at corner River and Putnam Streets.

—New Jersey, Paterson. A new concern, known as the Symington & Isaacs Silk Co., has recently been started here, manufacturing dress silks, at 15 Broadway. They operate 20 looms.

—New Jersey, Paterson. Robert Love has recently started manufacturing grenadines in the Broomhead Mill, operating 8 looms.

—New Jersey, Paterson. Sigfred Butz has started manufacturing dress and tie silks in the Adams Mill, Van Houten Street. Equipment consists of 30 looms.

—New York, Brooklyn. John Prescott, formerly connected with the silk mill at Unionville, has formed a partnership with a Mr. Streeter and will move the looms to this place.

—Pennsylvania, Allentown. John A. McCollom and Charles Riber, formerly connected with the Pioneer Silk Mill, in charge of the throwing and ribbon departments, respectively, will start a new mill at this place, making same goods.

—*New Jersey, Paterson. The Century Throwing Company, of which Peter R. Rowson is president; Alexander McLane, treasurer and Chas. F. Isleib, vice-president and superintendent, and which will have plant located in the Harmony Mill, will start operations about May 1st. They will have 13,500 spindles (from the Hamil & Booth Mill) on silk throwing.

—New Jersey, Summit. A new mill, for manufacturing umbrella silks will be built here by E. Gavazzi, of Italy, and Messrs. DeForest, who now operate a plant at this place. It is expected to have the new mill completed and ready to start operations in September. Messrs. DeForest will supervise the new plant.

—Pennsylvania, Allentown. A finishing department will be added to the Pioneer Silk Mill, hereafter known as the Allentown Silk Mill. The goods were previously sent to Paterson for finishing. (This plant has been recently secured by Givernaud Bros.)

Miscellaneous.

New Mills.

—Delaware, Wilmington. Hawthorne & Culp have established a new plant at this place. They will print on hosiery and make stamping inks for hosiery mills.

—Pennsylvania, Philadelphia. Joseph Richardson, formerly with Erben, Harding & Co., as overseer of dyeing, will start a new plant for himself, doing custom dyeing of worsted yarns and slubbing.

—Rhode Island, Rockland. The Clayville Dyeing & Bleaching Co. is the new concern in which Mr. Smith was previously reported connected at Clayville.

—*Rhode Island, Woonsocket. The Hart Textile Co. has resumed work of installing the machinery in the Ballou Mill. The company has been newly organized with J. J. Hart, president; S. Norris Wilson (Boston) treasurer and Charles A. Dustin, (Boston) asst. treasurer and secretary. It is reported that the mill will be ready for active operation in about six weeks. This plant will bleach, dye and finish plushes and corduroys.

Mills Starting Up.

—*Massachusetts, Indian Orchard. Operations have been started by the American Flax Company, which removed here from Meredith, N. H.

—Massachusetts, Whitman. The Whitman Shoe Factory, which has been idle for some time, is reported to have been purchased by the American Linen Fibre Co. It will be remembered that this concern, or one of similar name, with which J. A. Burleigh was connected, was located at Woburn, Mass., and petitioned into bankruptcy in March, 1900. The concern has apparently been re-organized. Present officers are: President, W. M. Richardson; treasurer, Lewis Brittan, and general manager, J. C. Burleigh. They have a process of manufacturing flax waste into absorbent linen stock and other specialties.

Fires.

—Massachusetts, Athol. The mill operated by L. S. Van Valkenburg, making satinet warp and coarse yarn, was destroyed by fire on March 30th. Loss is estimated at about $15,000, on which there was a partial insurance.

—New York, New York. The Germania Knitting Works, Wm. Reichman, proprietor, were damaged to the extent of about $20,000 by fire recently.

—Ohio, Barnesville. The Barnesville Hosiery Co.'s plant has been totally destroyed by fire. Loss is estimated at about $60,000, with insurance of about $30,000.

Failures and Suspensions.

—New Hampshire, No. Salem. W. H. Hanson, manager of the Salem Worsted Mill, has been petitioned into voluntary bankruptcy.

—New Jersey, Paterson. A voluntary petition in bankruptcy has been filed by Eaton & Sutton, broad silk manufacturers. The liabilities are estimated at $7,617.50, with assets of $7,000. Frederick Beggs, lawyer, has been appointed receiver to settle the affairs.

—Pennsylvania, Philadelphia. The creditors of Albert R. Elsasser have petitioned him in involuntary bankruptcy.

—Rhode Island, East Greenwich. A petition of voluntary bankruptcy has been filed by James N. Bourne, formerly of the Bourne Bleachery. The liabilities are estimated at $37,889.83, with no assets. Campbell & Bourne (Manchester, N. H.) and Peter Corr (Taunton) are mentioned among the creditors.

—Rhode Island, Woonsocket. Alfred Lange, formerly proprietor of the East Blackstone Spinning Mill, at East Blackstone, Mass., has filed petition of voluntary bankruptcy. In statement given, liabilities are estimated at $15, 976.55, with assets of $60.

Facts and Gossip.

—Arkansas, Little Rock. The Little Rock Cotton Mills have been re-organized under the same name, the Pine Bluff stockholders having sold their interests to local men. A. D. Thomas was re-elected president. It is reported that enlargements may be made to the plant.

—Arkansas, Mammoth Springs. It is reported that the cotton mills at Mammoth Springs have changed hands and that Mr. L. T. Moore's interest has been purchased by C. G. Eno, of Kansas City.

—Canada, Victoriaville. Paul Tourigny has been granted a bonus of $20,000 to establish a woolen mill at this place.

—Connecticut, Central Village. The Kirk Mills have been purcased by Warren D. Arnold of Pawtucket, and one of the owners of the Westerly Woolen Mills, who will convert the plant into a woolen mill, making cloth. A new weave shed will be built and other alterations and improvements made, including installation of new machinery, before the plant will be ready to be put in operation. Sometime ago it was erroneously reported by

other papers that Edward Milner and Charles S. Bragg had purchased the plant.

—Connecticut, Danielson. We understand that the Danielsonville Cotton Co., which was bought a few years ago by George P. Taylor, of Clinton, Mass., has been sold by him to the Cochrane Mfg. Co. of Dedham and Malden. It is stated that the plant will be enlarged and put in operation at once.

—*Georgia, Adel. We have been advised by J. M. Sutton that the project of erecting a knitting mill is being considered by local and outside capitalists, and although it is quite probable that a $30,000 plant will be established during the year, nothing definite has yet been done regarding the matter.

—Georgia, Augusta. The Isaetta Mills, Augusta, which have been shut down of late, have been purchased by Woodward, Baldwin & Co., of Baltimore, Md., and they will put the plant in full operation.

—Georgia, Tennille. An application for appointment of a receiver for the Tennille Cotton Mills (a new concern) has been made by J. S. Schofield's Sons & Co., Macon, and the Massee & Felton Lumber Co.

—Maine, No. Monmouth. The Annabessacook Mill has been incorporated with capital stock of $50,000. James E. McIlroy is president and R. C. McIlroy, treasurer. They will operate the mill of which M. C. McIlroy was formerly proprietor.

—Maryland, Dickeyville. The Ashland Manufacturing Co. has purchased the old Powhatan Mill property, a short distance above them on the stream. Quite recently the Powhatan Woolen Co. was formed by Nicholas W. Steele and George W. Albaugh, formerly connected with the Oakland Manufacturing Co., and it was proposed to erect a woolen mill on the old Powhatan Mill site. The Ashland Co. is supposed to have taken the property to prevent the pollution of the stream.

—*Massachusetts, Blackinton. It is reported that a new company will probably be organized to carry on the business of the Blackinton Co., recently reported in hands of receiver for purpose of dissolution. The mill will be operated until July 1st, on orders on hand, but after that it is not definitely known just what will be done.

—*Massachusetts, Milford. The Magid-Hope Silk Manufacturing Company has been re-organized under name of National Silk Yarn Co. E. A. Pousland was elected to fill the board of directors. Mr. Magid retires. A meeting will soon be held for election of officers of the new company.

—*Massachusetts, Newton. The property of the Nonantum Worsted Co., recently sold at auction to F. Eugene Ames, and again placed at auction owing to inability to meet terms of previous transaction, has been purchased by Walter A. Webster, of Boston, for $137,100. The unpaid taxes amount to $6200.

—Massachusetts, Oxford. It is reported that John Rich of Millbury has purchased the Gates property and contemplates starting up a shoddy plant.

—Massachusetts, Springfield. The offices of the Whittier Mills, Lowell, Mass., have been removed to 310 Main street, Springfield.

—*Massachusetts, Williamsburg. Efforts are being made by F. A. Brooks, who has charge of the woolen mill property here, to sell the plant and get same in operation again.

—Nebraska, Kearney. The Kearney Cotton Mills are running out stock, and it is expected that by the end of this month the plant will be shut down. No effort is being made to retain operatives, and they are looking for other places, and it is thoroughly understood that the mill will be closed. There are some reports that the machinery will be moved South, and the building changed over into a sugar beet factory. C. N. Brown, the treasurer, declines to give out information at present.

—New Jersey, Hoboken. The Roside Fabric Co., with office at 624 Clinton St., has been incorporated with capital stock of $30,000 to manufacture and sell fabrics.

—New Jersey, Passaic. The Lodi Dry Dyeing Co., has been incorporated with capital stock of $100,000 to succeed the Lodi Dry Dye Works. Samuel Briggs is president; Ed. Freedman, treasurer and Sam'l D. Freedman, superintendent. Dyeing, re-dyeing and finishing of silks, satins, velvets, etc., is done.

—New Jersey, Paterson. The Silk Dyers' Trust known as The Columbia Silk Dyeing Company, has been organized with capital of $3,000,000, consolidating six of the largest plants in the country; viz. Wiedmann Silk Dyeing Co., Knipscher & Maas, Emil Gehring, Kearns Bros. and Auger & Simons.

—New Jersey, Weehawken. The Clifton Silk Mills Co. has been incorporated with capital stock of $200,000 to operate the silk mills of James McCreery & Co. The mills do not enter into the combine called the Associated Merchants' Co., which has purchased McCreery's retail store.

—New York, New York. The Anchor Color Manufacturing Co., 466 Cherry Street, has made an assignment to Alfred T. Carroll.

—Pennsylvania, Norristown. The Eureka Knitting Mills, Adams and Harman, proprietors, will now be carried on by Ed. S. Adams, Mr. Harman having severed his connection with the concern.

—*Pennsylvania, York. J. Allen Baer, former vice-president of the Monarch Silk Company, has succeeded Frank Reeser (resigned) as secretary and treasurer. John B. Sprenkle was elected vice-president.

—Rhode Island, Allenton. The Belleville Woolen Company is a new corporation formed to operate the Belleville Mfg. Co.'s mill at this place, which is part of the property of the Campbell estate. James R. Wilson is president and James W. Leese (Providence) treasurer.

PERSONAL RECORD.

Cotton.

—W. E. Andrews has resigned as overseer of beaming, twisting and drawing in at the Arasapha Mills, Chester, Pa., after a service of 23 years.

—Frank L. Allen, secondhand at the Indian Head Mills, Cordova, Ala., has accepted the position of overseer of weaving with the Thomaston (Ga.) Cotton Mills.

—Adelbert J. Bennett, for the past seventeen years paymaster at the Linwood Cotton Mill, Whitinsville, Mass., has resigned. He is succeeded by James C. Brown, paymaster at the Whitinsville Cotton Mills, and Charles R. Ward will take Mr. Brown's place in the Whitinsville Cotton Mill office.

—Robert W. Boys is boss weaver for the Williamstown Manufacturing Co., Williamstown, Mass.

—Samuel Booth is the new boss slasher, spooler, twister and drawer at the No. 2 Hargraves Mill, Fall River, Mass.

—Herbert Bragg, formerly of North Vassalboro, Me., is now superintendent at the Beacon Manufacturing Co., New Bedford, Mass. He was at one time boss carder at the Tremont & Suffolk Mills, Lowell, Mass.

—James J. Carroll, overseer of carding in the Atlantic Cotton Mills, Lawrence, Mass., has resigned.

—A. C. Cantebury, boss carder at the Meridian Cotton Mills, Meridian, Miss., is now boss carder and spinner at the Tupelo Cotton Mills, Tupelo, Miss.

—Morris Cogan has resigned as overseer of the carding room of the Canadian Colored Cotton Co., of Merritton, Ont., Canada, to accept the position of superintendent of the Beaver Dam Cotton Mills, Beaver Dam, Wis.

—J. J. Daggett, of Concord, N. C., has accepted a position as overseer of weaving at the Tipton Cotton Mill, Covington, Tenn.

—Albert Eastwood, who has been secondhand in the spinning department of the Berkshire Cotton Mills, Adams, Mass., is to take charge of the spinning department of a large mill at Killingly, Conn.

—G. O. Fiedler has accepted the position of superintendent and designer with D. Trainer & Sons' Manufacturing Co., Trainer, Pa.

—Z. M. Floyd is now overseer of weaving at the People's Cotton Factory, Montgomery, Ala., having recently resigned a similar position at the Thomaston (Ga.) Cotton Mills. He succeeds John Nuttall, who has accepted a position with the Eufaula (Ala.) Cotton Mills.

—J. T. Ferguson, late of the Boott Manufacturing Co., Lowell, Mass., has succeeded Harold Lawton as superintendent of the Warwick Mills at Centreville, R. I.

—D. R. Harriman, of Greenville, S. C., is the new superintendent of the Buffalo Cotton Mills, Union, S. C.

—James Harris, for many years assistant local agent of the Willimantic (Conn.) Linen Co., has been appointed superintendent of the W. Warren Thread Works, Westfield, Mass., and assumed his new duties May 1st.

—William R. Johnston, after a continuous service of 28 years, has severed his connection with the York Manufacturing Co., Saco, Me. Mr. Johnston entered the employ of the company when he was a small boy, and has worked himself up to the position of secondhand. The employes presented him with a gold watch chain and charm.

—D. Jameson, formerly dyer at the Southern Cotton Mills, Bessemer City, N. C., has accepted the overseership of dyeing with the Hope Mills Mfg. Co., at Hope Mills, N. C., succeeding Mr. Mahoney.

—George Lane, who has been connected with the Lawton Spinning Co., Woonsocket, R. I., as overseer of one of the departments, has accepted a position with the New Hampshire Spinning Co., Penacook, N. H.

—F. J. Lennon, boss dyer at the Eagle Mill, Woonsocket, R. I., has gone to Utica, N. Y.

—John M. Lawless, recently with the Richmond Spinning Co., Eastlake, Tenn., has accepted the position of overseer of mule spinning, on night force, at the Paragon Mills, Cedartown, Ga.

—James McCarthy, of New Bedford, has been engaged as overseer of ring spinning, spooling, warping and twisting by the Grant Yarn Co., Fitchburg, Mass.

—J. C. Mailloux has been engaged by the Social Manufacturing Co., Woonsocket, R. I., to take charge of the weaving departments of the Social and Nourse Mills, succeeding J. C. Nash, resigned.

—J. Maloney, designer and general superintendent of the weaving department of the Hope Mills Mfg. Co., Hope Mills, N. C., has resigned to accept the general superintendency of the Holt-Morgan Mills at Fayetteville, N. C.

—John Mahoney has resigned as overseer of dyeing at the Hope Mills Mfg. Co., Hope Mills, N. C., to accept a similar position with the Holt-Morgan Mills at Fayetteville, N. C.

—J. C. Nash has resigned as overseer of the weaving departments of the Social and Nourse Mills, Woonsocket, R. I.

—George Payne, overseer of spinning at the Turners' Falls Cotton Mills, Turners' Falls, Mass., has resigned.

—Paul Pellitier, formerly of the Bristol Mill, New Bedford, Mass., has succeeded Edward Dudley as boss spinner at the Nos. 1 and 2 Merchants' Mill, Fall River, Mass.

—G. H. Richardson, manager of the Standard Spinning Co., Chester, Pa., severed his connection with that firm recently.

—Walter E. Rogers has been promoted to the position of overseer of the packing room of the mills of J. & P. Coates Thread Co., Pawtucket, R. I., to succeed William H. Tracy, who recently retired from that position, and Thomas Reilly has been made overseer of the box shop and William T. Butters foreman of the shipping department.

—Robert J. Stewart, superintendent of the Hamlet Textile Co.'s mills at Woonsocket, R. I., has resigned to accept a similar position in the cotton mills at Ashton, R. I. Mr. Stewart will be succeeded by Robert G. McMeehan, who has been employed in the No. 1 mill of the Lonsdale Co., Lonsdale, R. I., for the past seven years as overseer of the ring and mule spinning departments. The removal of Mr. McMeehan from Lonsdale will be regretted by a large circle of acquaintances, all of whom, however, are glad to learn of his increased prosperity.

—J. W. Shea, formerly with the Columbia Mills, Columbia, S. C., has commenced work as boss spinner at the Bourne Mills, Fall River, Mass.

—John Sullivan, for the past nine years master mechanic at the Acushnet Mills, New Bedford, Mass., has resigned and returned to Fall River, to accept a position in the King Phillip Mills.

—D. W. Stinson, of Salem, is the new overseer of spinning at the mill of the Clinton Mfg. Co., Woonsocket, R. I., succeeding James Martin. Mr. Stinson was formerly secondhand in the spinning department in Salem under H. K. Drew, now superintendent of the Clinton Mill.

—William L. Towne has resigned his position as overseer of weaving with the Otis Co., Ware, Mass.

—Charles S. Tuttle, Jr., formerly of Tremont & Suffolk Mills, Lowell, Mass., is now boss spinner of the Nos. 1 and 2 spinning rooms of the Bennett Spinning Co., New Bedford, Mass.

—R. Vick, overseer of the carding department of the Kearney Cotton Mills, Kearney, Neb., has resigned and accepted a similar position in the Meridian Cotton Mills, Meridian, Miss.

—W. J. White, formerly of Montgomery, is boss weaver at the Avondale Mills, Birmingham, Ala.

—W. P. Wingate has resigned as superintendent at the Ada Manufacturing Co., Charlotte, N. C., to accept the position of night superintendent at the Avon Mills, Gastonia, N. C.

—Walter B. Lovatt, superintendent of the Read & Lovatt Silk Mill at Weatherly, Pa., has tendered his resignation. He will go to Paterson, N. J., to take charge of the William Strange Mills. His successor at Weatherly will be Ray Throp of Elmira, N. Y., who has been at Weatherly for the past year learning the different departments. Mr. Lovatt has been superintendent at the Weatherly silk mill since it was put in operation, twelve years ago.

Woolen.

—Arthur Austen, who has been designer for the Plymouth Woolen Co., Plymouth, Mass., has resigned to accept a position with the Singleton Worsted Co., Franklin, Mass.

—Charles Ayers is now boss finisher for the Davis & Brown Woolen Co., Dayville, Conn.

—Thomas W. Biddles, from Potter Hill, R. I., has assumed charge of the finishing department of the Conshohocken Woolen Mill, West Conshohocken, Pa. He succeeds E. Taintor, who has returned to his home near Lowell, Mass.

—Frank Benway has resigned his position at the Jefferson (Mass.) Manufacturing Co., to accept one at Providence, R. I.

—James Bennett, of East Glastonbury, Conn., has been engaged to take charge of the spinning department of the American Felt Co., Glenville, Conn.

—George H. Coburn, who has for the past five years managed the Walter Aiken Sons' hosiery mills at Franklin Falls, N. H., completed his duties in that position on April 20th, and the owners are now supervising the business of the concern.

—George C. Crane has accepted the superintendency of the Melrose Woolen Co., manufacturers of dress goods, Auburn, N. Y., succeeding the late Thomas A. Holland. Mr. Crane was formerly superintendent for the Mt. Battie Manufacturing Co., Camden, Me., and the Crosby Manufacturing Co., Glastonbury, Conn.

—Edward Craven, who for 33 years has been superintendent of the mill of Abbott & Co. at Graniteville, Mass., severed his connection with the firm last month, having decided to retire from active work. There have been many expressions of regret since the fact of his retirement became known. He was the recipient of two gifts,—a gold watch from the employees at the mill and a silver loving cup from the members of the firm. Mr. Craven, with his wife and son, have gone to England, and will remain abroad for some little time. He is succeeded by Henry Smith, the overseer of the combing room.

—George Dunham, Jr., has accepted a position with the Monongahela Textile Co., Morgantown, W. Va., as superintendent.

—Joseph Dolan, formerly boss finisher in the Lakeside Mill, East Madison, Me., is now boss finisher in Sayles & Gilleran's mill, Woonsocket, R. I.

—John Eastwood, Winooski, Vt., has recently accepted the position of overseer of finishing at F. S. Mackenzie's mill at Bridgewater, Vt.

—Frank Eastwood, formerly superintendent of the Burlington Woolen Mill at Winooski, Vt., has been engaged as superintendent of the Hockanum Co., Rockville, Conn.

—Thomas Evans, formerly connected with Schofield, Mason & Co.'s mill, Philadelphia, Pa., has succeeded Fre[illegible] as superintendent of the Whittall Carpet Mill, Worcester, Mass.

—James J. Grady has entered the employ of Graham, Clark & Co., woolen manufacturers, Adams, Mass., as overseer of carding.

—James R. Garnett, recently with Heritage & Hurst, Monson, Mass., has taken charge of the finishing in the Pondicherry Mill, Bridgton, Me.

—Thomas Goddard recently resigned as boss finisher at the Pondicherry Mills, Bridgton, Me.

—John B. Garside, overseer in the No. 1 spooling mill of the Hartford Carpet Co.'s works, Thompsonville, Conn., for a number of years, has retired, owing to the closing down of his department.

—Albert Holdsworth, an overseer in the Goodall Worsted Co., Sanford, Me., has accepted a position at the Queensbury Mills, Worcester, Mass.

—John Henry has resigned as cloth examiner for the National and Providence Worsted Mills, Olneyville, R. I., which place he filled for several years.

—Daniel Henson, who has been pattern weaver at the Carolina Mills, Carolina, R. I., for a number of years, has resigned, and accepted a similar position at the Livingstone Mills at Washington Village, R. I. Hartley Walton, of Carolina, R. I., has taken Mr. Henson's place.

—Albert Hess, of Auburn, N. Y., is now engaged with the Hanover Woolen Co., Hanover, Ill., as boss finisher.

—Jacob Kessler, who has been superintendent of A. Lomas & Sons' woolen mill, Sherbrooke, Que., has resigned to take a similar place with the Crosby Mfg. Co., Glastonbury, Conn.

—Thomas Kingsley, who for the past two years has been employed by Beebe, Webber & Co., in charge of their carding department, has resigned to accept a similar position with the Lippitt Woolen Co., Woonsocket, R. I. Mr. Kingsley was previously in the employ of the Lippitt Woolen Co. for ten years, being in charge of their carding department.

—Harry Kemp, formerly of Merchants' Woolen Mill, Dedham, Mass., is the new boss carder at the Aetna Mills, Watertown, Mass.

—John T. Lord has been appointed superintendent, in place of George Owen, deceased, of the Pacific Mills, Lawrence, Mass. Mr. Lord has been an assistant in the office of the Lower Pacific for about 10 years. Another promotion is that of Thomas Holgate, who has been employed in the dyehouse, to assistant superintendent.

—Fred Marvin, for several years overseer of the finishing department at the Stevens Mill, North Andover, Mass., recently severed his connection with that concern.

—Nelson Morey has resigned as boss dyer at the Hockanum Mill, Rockville, Conn., and is succeeded by Charles E. Mead.

—Walter Moorehouse, for a number of years employed as overseer of carding in the Essex Felting Mills, Picton, N. J., operated by the American Felt Co., has been succeeded in that position by Mr. Locke, who has been employed in that capacity for some years by the Vesta Knitting Mills, Providence, R. I.

—Walter A. Neiber, for the past two years superintendent of the Hampden Mills Co., Hampden, Mass., has resigned, and will go to Louisville, Ky., where he has a similar position.

—John C. Thickens, for a number of years superintendent of the William Tillotson Mills at Pittsfield, Mass., has accepted a similar position in the upper mill of the J. L. & T. D. Peck Manufacturing Co. at Pittsfield, Mass.

—Joseph Richardson, overseer of dyeing for Erben, Harding & Co., Philadelphia, Pa., for the past five and a half years, has tendered his resignation, and will engage in business on his own account, doing custom dyeing of worsted yarns and slubbing.

—Herbert Rawnsley, overseer of worsted spinning at the Collingwood Mills, Philadelphia, has resigned and is now with the Manhattan Mills, New York.

—George Raymond, of Stottville, N. Y., has taken the position of overseer of carding and spinning at C. W. Rockwell & Co.'s mill at Rockwell's Mills, N. Y., and Isaac Walker, boss carder, from Laconia, N. H., succeeded to Mr. Raymond's place as boss carder of the No. 1 mill at Stottville.

—Arthur Rood, for many years boss carder in the Cushman Home Mill, Monson, Mass., has resigned his position.

—Frederick Swindell, superintendent at the Rock Woolen Mill, Rockville, Conn., has resigned and will retire from his position in June.

—E. P. St. Onge, of Pawtucket, R. I., has engaged as boss dresser with the Oneko Mills in New Bedford, Mass.

—E. C. Short, of Saugus, Mass., has gone to La Porte, Ind., to take charge of finishing for the King & Fildes Co.

—George F. Smith, formerly boss carder at Methuen, Mass., is now filling a similar position at the Oneko Mills, New Bedford, Mass.

—George Sears has resigned as superintendent of the Red Mill of the Charles River Woolen Co., North Bellingham, Mass. He held this position for eleven years. George Palmer succeeds him.

—Jeremiah P. Townson, formerly overseer in the No. 1 worsted mill of the Hartford Carpet Co., Thompsonville, Conn., has been appointed overseer of the No. 2 worsted mill, taking George Morrison's place.

—George Welton, who has been employed for the past 30 years in the carpenter shop of the Hartford Carpet Co., Thompsonville, Conn., and for the past 12 years in charge of the electrical department of the works, has severed his connection with the company.

—C. E. Washburn has resigned as overseer of the dyeing and wool sorting departments at the Blackinton Co., Blackinton, Mass. He has secured a position in a woolen mill at East Rochester, N. Y.

—Henry C. Willis, overseer of weaving at the Oakland Mfg. Co., Baltimore, Md., has resigned, and is now occupying a similar position with James Irving & Son, Chester, Pa.

—D. Watters, of Hallville, Conn., is boss carder at Poquetanuck, Conn., in place of H. A. Welch.

Knit.

—William J. Elliott has accepted a position as overseer of knitting with the Powhatan Manufacturing Co., Norfolk, Va.

—Samuel W. Holsapple has severed his connection with the Union Knitting Co., Hudson, N. Y.

—C. W. Hayes, who has been connected with the Grand Rapids Knitting Co., Grand Rapids, Mich., since its organization, recently resigned as treasurer and manager, and is now filling the position of manager of the underwear manufacturing department of the Racine Knitting Co., Racine, Wis.

—G. A. Long has changed from the Park Hosiery Co., of Pottstown, Pa., to the Harrisburg Knitting Mill, Harrisburg, Pa.

—W. D. Neilson, formerly with the Sagamore Knitting Mill, Mechanicsville, Conn., is now engaged with the Knickerbocker Mill, same place.

—Frederick Oliver has resigned as overseer of the full-fashioned hosiery department in the Sulloway Mills, Franklin, N. H., to accept an engagement in Philadelphia.

—Bert Relyea, assistant foreman of the knitting room of the Regal Knitting Co., Utica, N. Y., has resigned, to accept a more responsible position in Atlanta, Ga.

—Matthew Ward recently succeeded John C. Colquhoun as overseer of carding in No. 2 mill of the Victo Knitting Mills, Cohoes, N. Y., when the latter resigned to accept a similar position with the Garfield, N. J., Woolen Co.

—H. E. Wilson, superintendent of the Uncas Knitting Co., Danielson, Conn., has resigned. His brother, L. L. Wilson, succeeds him. Mr. Wilson goes to Norfolk, Va., to superintend a larger mill.

Deaths.

—Silas W. Goddard, a life-long resident of Worcester, Mass., and many years one of the prominent manufacturers of the city, died there recently. Mr. Goddard was born in Millbury, Feb. 17, 1831. His father was a manufacturer of wall paper machinery, and the son learned the trade of machinist in his factory. Upon the death of his father, the deceased became connected with the firm of E. C. Cleveland, manufacturers of woolen machinery, in the capacity of agent. He was later superintendent of the plant, and in 1880, after the death of Mr. Cleveland, entered the firm as a partner of Mrs. Cleveland, under the firm name of the Cleveland Machine Works. In 1898 the firm assigned and since then Mr. Goddard had been doing a commission business in machinery.

—A. S. Briggs, president of the Ashaway (R. I.) Woolen Co., died last month in Florida. Mr. Briggs was born in Charlestown, R. I., in 1824, and spent the early part of his life on a farm. When 20 years old he went to work in the woolen mills at Ashaway, and four years later was made superintendent of the mills. In 1882 he purchased the property, afterward turning it into a corporation.

—John Mulrooney, a well-known carder, and for the past seven years secretary of the National Association of Woolen and Worsted Overseers, died on April 23d, after a short illness. At the time of his death, Mr. Mulrooney held the position of overseer of carding of the American Woolen Co.'s mill at Enfield, N. H. A widow and two children survive him.

—Robert J. Walker, aged 82, died at his home in Philadelphia, Pa., on April 12. Mr. Walker was the oldest established finisher in Philadelphia. In 1852 he established the Guard Finishing Works, known afterward as the Star Finishing Works.

—Much sympathy is expressed for Andrew Scotland in the death of his estimable wife, who died on April 10th at the residence of her daughter at Round Lake. About twenty years ago Mr. and Mrs. Scotland and family removed from Cohoes to Waterford, and from Waterford they went to Round Lake. Mr. Scotland is a well-known knitter in this section, and their many friends learned with much regret of the loss.

—William D. Holmes, a well-known silk manufacturer, of Paterson, N. J., died early last month. Death was due to blood poisoning, which followed an operation for appendicitis performed two weeks previous. Mr. Holmes was born in Bradford, Eng., in 1846. Prior to coming to this country, in 1871, he had been a broad silk weaver, and after arriving in Paterson secured work in the Oldham Mills in Haledon. Three years later he started a broad silk weaving plant in Paterson, with two or three looms, removing several times to larger quarters, as his growing business required more room, until finally, in 1885, he moved into the large Barnet Mill, manufacturing dress goods, veiling, handkerchiefs, mufflers, etc. He is survived by a widow and one daughter.

—H. Clay Bliss, 81 years of age, a former prominent manufacturer and town official of North Adams, Mass., died recently. In 1861 he engaged in wool manufacturing in the firm of Tyler & Bliss. They made cloth for government clothing through the war, and were very successful, but failed in 1869, when Mr. Bliss retired from business.

—Francis Gray, the organizer and president of the F. Gray Woolen Mill, Piqua, O., died at his home, March 30th, of Brights' disease. He was in his seventieth year.

—Robert C. Houston, of Sangerville, Me., died on April 2d. Mr. Houston was born in Paisley, Scotland, about sixty-four years ago. He emigrated to this country in 1867. His first position was in Milton, N. H. Since then he has been identified with some of the best woolen mills in the country. When the Sangerville Woolen Co. started their new plant, in about the year '92,he engaged as overseer of dyeing with them, which position he held until his death.

—Joseph H. Potter, for ten years overseer of the spinning room at the Sagamore Mill No. 2, Fall River, Mass., died at his home there recently. The deceased was well known in the city, and was highly respected by all who knew him. He leaves a widow and four married children, among whom are Joseph H. Potter, superintendent of the Durfee Mills, and John W. Potter, overseer in the Sagamore Mills.

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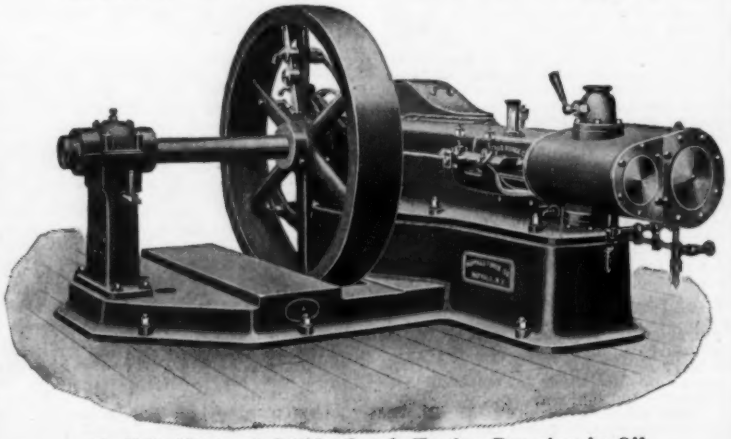

Buffalo Horizontal Side Crank Engine Running in Oil

Buffalo Forge Company, BUFFALO, N. Y.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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American Moistening Co., 150 Devonshire St., Boston.
Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.
Architects and Mill Engineers.
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Gray, Arthur F., Exchange Bldg., Boston.
Lockwood, Greene & Co., 93 Federal St., Boston, Mass.
Praray, C. A. M. & Co., Banigan Bldg., Providence, R. I.
Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.
Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.
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Warren Bros. Co. 143 Federal St., Boston.
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Brown, W. H, Mechanic St, Worcester Mass.
Carpet Machinery.
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Furbush, M. A, & Son, Machine Co, Phila, Pa.
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Smith, Jas. Woolen Machinery Co., Phila.
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Chemicals and Apparatus.
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Houghton, L. T. & Sons, Worcester, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co., Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowe, Stephen C., 186 Devonshire St., Boston, Agt. John Hetherington & Sons. Ltd.
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Howard & Bullough American Machine Co, Pawtucket, R. I.

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Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

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Moore, Benj. & Co., Brooklyn, N. Y.

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Hendry, T., 406 W. 36th St., N. Y.

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Stein, Hirsh & Co, 165 Duane St., New York.

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Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.

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American Yarn Printing Works, 134-150 North 22d St., Philadelphia.
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Cohoes Dye Works, Cohoes, N. Y.
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Davidson & Brooke, 2560 No. 3rd St., Philadelphia.
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Firth & Foster Co, Kensington, Pa.
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Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Knause Bleachery, Hamburg, Pa.
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Pond Lily Co., New Haven, Ct.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
Automatic Dyeing & Scouring Machinery Co., New York.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Antisdel, E. M., 12 Miller St., Utica, N. Y., (Knit Dryer.)
Birch Bros., Somerville, Mass.
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Delahunty Dyeing Machine Co., Fittston, Pa.
Dubois, A. N., 2170 Ledgely Ave., Philadelphia, Pa. (Black for Hosiery.)
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.

Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Webendorfer & Walling, Paterson, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

Dye Sticks.
Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, K. M , Philadelphia, Pa.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, A Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Calmore & Co., 501 Chestnut St , Phila.
Corey, S. J, 273 Congress St, Boston
Dillon & Co. 20 Cedar St, New York.
Dubois, A. N., 2170 Ledgely Ave., Phila., Pa.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Fortner, L. B., 36 Strawberry St., Phila.
Geisenheimer & Co, 189 Front St, New York.
Holliday & Sons, Ltd., Read, 7 Platt St., New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Johnson, Wm. G, & Co, Uncasville, Conn.
Jones, J. Howell, 18 Burling Slip, New York.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Matheson, W. J, & Co, 182-184 Front St, N. Y.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Roessler & Hasslacher Chemical Co, 100 William St , New York.
Ross, W. A. & Bro., 100 William St., N. Y.
Schoellkopf, Hartford & Hanna Co., Philadelphia, N. Y. and Boston.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Sykes & Street, 85 Water St, N. Y
Thayer, Ed M., 106 Broad St., Boston, Mass.
United Indigo & Chemical Co., Ltd., 176 Federal St., Boston.
Vila, H S., 115 So. 2nd St., Philadelphia, Pa.

Dynamos.
General Electric Co., 44 Broad St., New York
Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Elastic Web Calendering Machines.
Knapp, C. H., Paterson, N. J.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Electrical Construction.
General Electric Co., 44 Broad St., New York.

Electric Fans.
Buffalo Forge Co., Buffalo, N. Y.
General Electric Co., 44 Broad St., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila., Pa
Sturtevant Co., B. F., Boston.

Electric Lighting.
General Electric Co., 44 Broad St., New York.

Electric Motors.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.

Engine Foundations.
Warren Bros. Co., 143 Federal St., Boston.

Engineers, Mechanical.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Exhaust Heads.
Burt Manufacturing Co , Akron, Ohio.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co., Matteawan N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Feeds.
Philadelphia Drying Machinery Co . 6721 Germantown Ave , Phila., Pa.

Filters.
Scaife, W. B. & Sons, Pittsburg, Pa.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fireproof Construction.
American Bridge Co., The, New York.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Friction Clutches.
See Clutches.

Friction Hoisting Drums.
Eastern Machinery Co., New Haven, Conn.

Fuel Economizers.
Green Fuel Economizer Co., Matteawan, N. Y.

Fulling Mills for Woolen Goods.
Frank's Wagon Works, 2731 N. 6th St., Philadelphia.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R. & Son, Raritan, N. J.

Garnetts.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B. F., Boston.

Gears.
New Process Raw Hide Co., Syracuse, N. Y.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F , Boston.

Grate Bars.
U. S. Rocking Grate Bar Co., Elizabeth, N.J.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
The Eastern Machinery Co., New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Labels.
Docker, Foster Co., Philadelphia, Pa.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

Hydro Extractors.
American Tool & Machine Co , Boston.
Rusden Machine Co., Warren, R. I.

Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Charles, W, B., Amsterdam, N. Y.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Fleming & Chapin, Philadelphia.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Schneebeli, G. A. & Co., Nazareth, Penn.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Industrial Mfg. Co., Camden, N. J.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.
Willcox & Gibbs Sewing Mch. Co., New York.

Knitting Machine Cylinders.
Lindley, G. W., 5122 Wakefield St., Germantown, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
American Knitting Machine Co., 6th and Arch St., Philadelphia, Pa.
Antisdel, E. M., 12 Miller St., Utica, N Y.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Phila.
Kutz, S. Jarius Machine Works, Reading, Pa.
Lamb Knitting Mach. Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H .
Lindley, Geo. W., 5122 Wakefield St., Germantown, Pa.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.
Tompkins Bros., Troy, N. Y.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co , Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T. New Brunswick. N. J.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Philadelphia.
Lamb Knitting Machine Mfg. Co., Chicopee Falls, Mass.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co. Lakeport, N. H.

Knotter for Spoolers.
Barber & Coleman, 504 Sears Bldg., Boston.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St. Phila, Pa

Looms.
American Loom Co., Readville, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St , Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Whitin Machine Works, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Pickers.
Loom Picker Co., Biddeford, Me.

Lubricators.
Dixon, Jos., Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia.

Machinists' Tools.
Dodge Mfg Co., Mishawaka, Ind.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.
Fabric Measuring & Packaging Co., Postal Telegraph Bldg , New York.

Mechanical Draft.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
Rusden Machine Co., Warren, R. I.

Mill Architects.
See Architects & Mill Engineers.

Mill Baskets.
Lane, W. T. & Bro., Port Chester, N. Y.

Mill Brushes.
See Brushes.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bargamin, G. & A. Co., Richmond, Va.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Dixon Lubricating Saddle Co., Bristol, R.I.
Dodge Mfg. Co., Mishawaka, Ind.
Douglas, R. D., Fall River, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Lane, W. T. & Bro., Port Chester, N. Y.
National Supply Co., Paterson, N. J.
Smith, Jas. Woolen Machinery Co., Phila.
Southern Bobbin Co., Greensboro, N. C.
Star Mfg. Co., Stamford, Conn.
Sweet & Doyle, Cohoes, N. Y
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Columbia Napping Machine Co., Somerville, Mass.

Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.

Noils (Silk.)
Kyle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Oil Cabinets.
New York Oil Cabinet Co., New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Paint.
Moore. Benj. & Co, Brooklyn, N. Y.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Paper.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Boxes.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Box Machines.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Tubes.
Douglas, R. D., Fall River, Mass.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Siggers, E. G., Washington, D. C.
Wolhaupter, D. P., Equitable Bldg., Washton, D. C.

Pavers & Paving Materials.
Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
American Perforated Metal Co., 171 Wooster St., New York.
Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.
Southern Bobbin Co., Greensboro, N. C.

Pipe Covering.
Keasbey, R. A, 83 Warren St, New York.

Plumbers' Supplies.
Bargamin, G. & A. Co., Richmond, Va.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Beggs, James & Co., 9 Dey St., New York.
Dodge Mfg. Co., Mishawaka, Ind
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass.
Lambeth Rope Corporation, New Bedford, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.

Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Saginaw Manufacturing Co., Saginaw, Mich.
Smith, Jas. Woolen Machinery Co., Phila.

Preparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Presses.
Boomer & Boschert Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Printers (Fabrics and Yarn.)
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Acme Pulley Covering Co., 1 West 103rd St., New York.
Vacuum Cement & Pulley Covering Co., 1493 Third Ave., New York.
Warren Mfg, Co., 259 Franklin St., Chicago, Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Purifying & Filtration Plants.
Scaife, W B. & Sons, Pittsburg, Pa.

Raw Hide Gears.
New Process Raw Hide Co. Syracuse, N. Y

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Loom Picker Co., Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Barton, F. C., 54 Franklin St., New York.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co., 143 Federal St., Boston.

Roofing Materials (Manufacturers).
Warren Bros. Co., 143 Federal St., Boston.

Rope Transmission.
American Mfg. Co., New York.
Dodge Mfg. Co., Mishawaka, Ind.
Lambeth Rope Corporation, New Bedford, Mass'
Link Belt Mfg. Co., Chicago, Ill.

Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford. Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.

Scales
Sweet& Doyle, Cohoes, N. Y.

Schools.
American Correspondence School of Textile, New Bedford, Mass.
French Textile School, Atlanta, Ga.
Georgia School of Technology, Atlanta, Ga.
Lee's College, Charlotte, N. C.
New Bedford Textile School, New Bedford, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Selling Agents.
See Commission Merchants.

Separators.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Draper Co , The, Hopedale, Mass.

Separators, Oil and Steam.
Austin Separator Co., Detroit, Mich.

Sewing Machines and Supplies.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass
Excelsior Sewing Machine Co., Philadelphia.
Industrial Mfg. Co., Camden, N. J.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Rusden Machine Co., Warren, R. I.
Union Button Sewing Mch. Co., 164 High St., Boston.
Wilcox & Gibbs S. M. Co., New York.

Shafting Hangers, Etc.
See Power Transmission Machinery.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co. Cohoes, N. Y

Warren's Pulley Cover

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Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H., Paterson, N. J.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ma.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H , Paterson, N. J.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Arabol Mfg. Co., 155 William St., New York.
O. K. Soap Co., 968 Franklin St., Phila.
Potter, R. V. B., 231 Chestnut St., Phila.
Stein, Hirsch & Co, 165 Duane St, New York.

Sky Lights.
Drouve, The G. Co., Bridgeport, Ct.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips The Thomas, Co., Providence, R.I.

Soaps.
India Alkali Works, Boston, Mass.
O. K. Soap Co., 968 Franklin St., Phila.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Undergrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson. N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Spool Cotton for Mfrs. Use.
Standard Thread Co., New York.
Warren, W. Thread Works, Westfield, Mass.

Spooler Knotter.
Barber & Coleman, 504 Sears Bldg., Boston.

Sprinklers
International Sprinkler Co., Philadelphia, Pa.

Stamps for Hosiery.
Smith & Meinken, New York.
Wells, Wilfred, 505 W. Lehigh Ave., Philadelphia

Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co , Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co, Hamilton, O.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.

Steam Surface Coverings.
Keasbey, Robert A., New York.

Steam Specialties.
Austin Separator Co., Detroit, Mich.
Butterworth, H. W. Sons Co., Philadelphia.
Rusden Machine Co., Warren, R. I.
Jenkins Bros., New York.
Sturtevant Co., B F., Boston.
U. S. Rocking Grate Bar Co., Elizabeth, N.J.

Steam Valves.
Jenkins Bros., New York.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Cypress Lumber Co, Apalachicola, Fla.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co., Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Barton, F. C., 54 Franklin St., New York.
Cathcart, John, & Co, 115 Franklin St, N. Y
Fleming & Chapin, Philadelphia.
Friedberger Mfg. Co, Germantown, Pa.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Schneebeli, G. A. & Co., Nazareth, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.

Telephones.
Mianus Electric Co., Mianus, Conn.
Philadelphia Electric Construction Co., Philadelphia.
Plummer, F. O. 620 Atlantic Ave., Boston.

Temples.
American Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
See Dyeing, Drying, Bleaching and Finishing Machinery.
Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa
Textile Schools.
See Schools.
Thread Board for Spinning & Twisting Frames.
Houghton, L. T. & Sons, Worcester, Mass.
Thread Protectors.
Ring Frame Thread Protector Co., The, Amsterdam, N. Y.
Time Recorders.
Simplex Time Recorder Co., Gardner, Mass.
Tom Tom.
Frank's Wagon Works, 2731 N. 6th St., Philadelphia.
Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Tower Clocks.
Howard, E. Clock Co., Marlboro Building, Boston.
Trimmers.
Excelsior Sewing Machine Co., Philadelphia.
Turbine Governors.
Replogle Governor Works, Akron, O.
Turbines.
(See Water Wheels.)
Valves—Rubber.
Boston Belting Co., Boston, Mass.
Ventilating Apparatus.
Allington & Curtis Mfg. Co, Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Drouve, The G. C ., Bridgeport, Ct.
National Pancoast Ventilator Co., Philadelphia, Pa.
New England Ventilating & Heating Co, Providence. R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
Wing, L. J. Mfg. Co., 95 Liberty St., N. Y.
Wall Whitening.
Moore, Benj. & Co, Brooklyn, N. Y.
Warp Stop Motions.
Am. Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.
Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R., & Son, Raritan, N. J.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co , Warren. R. I.
Webendorfer & Walling, Paterson, N. J.
Watchman's Clocks.
Am. Watchman's Time Detector Co., Broadway, N. Y.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Howard, E. Clock Co., Marlboro Building, Boston.
Vanz & Co, 127 Duane St., New York.
Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.
Water Purifiers & Filters.
Scaife, W. B. & Sons, Pittsburg, Pa.
Water Wheels.
Alcott, T. C., & Son, Mt. Holly, N. J.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.
Water Wheel Governors.
Conoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Replogle Governor Works, Akron, O.
Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.
Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.
Winders. (Hosiery.)
Foster Machine Co., Westfield, Mass.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Universal Winding Co, 95 South Street, Boston.
Wood Pulleys.
Beggs, James & Co., 9 Dey St., New York.
Dodge Mfg Co., Mishawaka, Ind.
Saginaw Manufacturing Co, Saginaw, Mich.
Wool Cleaning Compound.
India Alkali Works, Boston.
Wool Combing Machinery.
Leigh, Evan A. 35 Mason Bldg., Boston.
Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N J.
Gerry, Geo. & Son, Athol, Mass
Sargents', C. G., Sons, Graniteville, Mass
Smith, Jas. Woolen Machinery Co., Phila.
Woolen Machinery.
American Machine Co., Kearney, N. J.
Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2216 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N.J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia, Pa.
Lowe, Stephen C., 186 Devonshire St., Boston. Agt. John Hetherington & Sons, Ltd.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas. Woolen Machinery Co., Phila.
Woonsocket Machine & Press Co Woonsocket, R. I.
Worcester Warp Compressing Machine Co. Worcester, Mass.
Wool Shoddies.
Slack, Wm. H. H., & Bro, Springfield, Vt.
Wool Washing, Preparing and Drying Machinery.
Hunter, Jas. Machine Co., No. Adams, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

YARNS, THREADS, ETC.

Banding.
Lambeth Rope Corp., New Bedford, Mass.
Moore, C. & Co, 12 S. 5th St, Phila, Pa
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Barnesville, Mfg. Co., Barnesville Ga.
Buckingham & Paulson, 83 Leonard St., New York.
Catlin & Co, New York and Boston.
Charles, W. B., Amsterdam, N. Y.
Dana Warp Mills, Westbrook. Me.
Dexter Yarn Co., Pawtucket, R. I.
Dodds, J. S., 517 Wool Exchange, New York
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Morgan, E. A. 54 Franklin St., N. Y.
New England Cotton Yarn Co , New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns Wool Spun.

Broadbent, J. & Sons, Unionville, Conn.

Flax. Hemp. Jute and Ramie.

Fawcett, Hughes, 115 Franklin St., N. Y
Eichmann & Sternberg, 530 Broadway, N. Y.
Morgan, E. A., 54 Franklin St., N. Y.

Gassed Yarns.

Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, New York.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
New England Cotton Yarn Co , New Bedford, Mass.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W, Thread Works, Westfield, Mass
Whittier Cotton Mills, Lowell, Mass.

Harness Twine.

Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Barnesville Mfg Co., Barnesville, Ga.
Boyer, B. F, & Co, Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn.
Cranston Worsted Mills, Bristol, R. I.
Dexter Yarn Co., Pawtucket, R. I.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co., New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co. N. Y.
Warren, W, Thread Works, Westfield, Mass
Whittier Cotton Mills, Lowell, Mass.
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mercerized Yarns.

Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co., Philadelphia.
Montgomery, J. R. & Co., Windsor Locks, Conn.
Morgan, E. A., 54 Franklin St., N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mohair Yarns.

Cranston Worsted Mills, Bristol, R. I.
Goff, D. & Sons, Pawtucket, R. I
Skerry, A. T, & Co., 47 Leonard St., N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, 530 Broadway, New York.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard, St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence. R. I.
Eichmann & Sternberg, 530 Broadway, New York.
Mason, Dan'l, Voorhis Mill, Paterson, N. J.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, Camden, N. J.
Broadbent, J. & Sons, Unionville, Conn.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket. R. I.
Salkeld, A. D. & Bro., 66 Leonard St., N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Boyer, B. F, & Co, Camden, N. J.
Campion, Richard, 17 Bank St., Philadelphia.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Goff, D. & Sons, Pawtucket, R. I.
Pocasset Worsted Co., Thornton, R. I.
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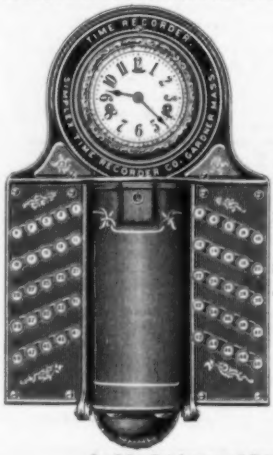

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The advertisers in the following columns should be addressed in care of TEXTILE WORLD or inquiries concerning them may be addressed directly to "Information Department TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

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WOOLEN SUPERINTENDENTS.

1829 **Woolen Supt.**, or asst. or dyer. Age 35; American; married. Has worked on kerseys, coverts, worsteds, cassimeres, etc. Is familiar with Davis & Furber jackets and mules, and Crompton & Knowles.

880 **Supt. or Assistant Supt.** and Designer. Over 25 years experience as Supt. and designer. Has designed and manufactured nearly all classes of goods made in a woolen mill, in wool and worsted, such as shawls, blankets, beavers, kerseys, cheviots, fancy cassimeres, overcoatings, worsted suitings, etc. 53 years old, married, with family. Would go west or nearly anywhere. Wants a mill where he can permanently settle and give them the benefit of his experience as a manufacturer. A first-class man.

1841 **Superintendent.** Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds.

1823 **Supt., Designer or Overseer** of weaving. Age 42; English; married. Large experience on fancy cassimeres, cloakings, beavers, meltons, plaid backs, golf caps, rugs, union worsted suitings and government work, flannels, face-finished goods, and can make them up from the yarn. Is familiar with Crompton & Knowles and English looms.

1398 **Woolen Superintendent or Designer** of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1575 **Assistant Supt. Woolen.** A graduate of the Philadelphia Textile School (highest standing), and has had more than 7 years' experience in the various departments of a Massachusetts mill. Wants to get a start where there is fair chance of advancement. Age 28, single.

1768 **Supt. and Designer** in a worsted or woolen mill. Prefers worsted mill. Now employed as designer and assistant supt., but is competent to take charge of a mill. Is familiar with all makes of machinery, and has manufactured nearly all classes of goods. Excellent references.

1856 **Supt. Worsted Yarn Mill.** 35 years old; Scotch; married. All kinds of worsted yarns in the gray mixtures and mottled, especially fine numbers. Bradford system.

COTTON SUPERINTENDENTS.

1877 **Agent or Treasurer.** Good references. Recently assistant manager of a large mill. Fully competent.

1806 **I would like** to correspond with some president or manager of some cotton mill now running or any new mill now being constructed, who would like to engage a competent superintendent. I want to engage with a cloth mill of any number of spindles not exceeding 10,000. My price is $1,000 a year, with no loss of time. I am a practical manufacturer, of long experience as overseer and superintendent. I am a good manager, full of push and energy, and I have a good record as a hustler for big productions and making money for my employers. Strictly temperate.

1802 **Supt.** or agent of small cotton or knitting mill, or would take a position as overseer of cotton carding. 33 years old; American. Has worked on sheetings, shirtings and fancy goods, and hosiery and mill supplies. Wants about $25 per week.

1867 **Assistant Manager** who understands the handling of cottons and linens, desires position in a cotton mill. 24 years of age; American; unmarried. Can satisfy anyone in regard to references, experience, etc.

1872 **Supt. and Carder of Cotton.** Has handled all classes of goods 35 years; American, married. Best of references.

1806 **Supt. of a Cotton Weaving Mill**, colored or white, 5,000 to 10,000 spindles; or overseer of weaving in a cotton mill, on any kind of work and any size mill, white or colored. Will go East, West, North or South, Canada or Mexico. Has had good and long experience. A married man; 40 years old, strictly temperate. Can give references as to ability and character.

1772 **Supt. or Overseer of Weaving.** Age 38; American; married. Lawns, fine sheetings and shirtings, sateens, twills, fancies, denims and cottonades. Is familiar with Whitin, Lowell, Draper, Northrop and English machinery. Not at present employed.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills

1453 **Superintendent** desires position in a cotton mill. Age 28; married; American. Has worked on prints, fine sateens, sheetings, ginghams duck, denims, cottonades, ticks, awnings and domets. Is familiar with all makes of spinning, spooling and warping machinery. Refers to past employers.

WOOLEN SPINNERS.

1691 **Boss Spinner.** Large experience in first-class N. E. mills on flannels and all kinds of fancy cassimeres. Englishman; age 50; married. Refers to past employers.

1784 **Worsted Drawer and Spinner.** Would take twisting. Age 2-; Englishi; si gle. Can furnish references as to ability and character.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

1862 **Overseer of Spinning.** Is used to Johnson & Bassett, Davis & Furber and Campbell & Clute machines. Has had 18 years' experience as an overseer. Is a handy ma-, and can give good references. Wool, cotton and mixtures.

1834 **Overseer of Spinning.** Experience covers eight years as second-hand and fixer and eleven years as overseer. Has handled nearly all kinds of goods. Is an expert fixer. Worked on Davis & Furber mules. Age 38; American; married.

1820 **Overseer in Woolen Spinning.** Has worked on ladies' dress goods, cassimeres, cheviots, beavers, all wool, and wool and cotton, and wool, cotton and shoddy mixes, from 1 run to 9. Davis & Furber Johnson & Bassett and Platt mules and jacks Refers to past employers. Wants $2.50 per day.

COTTON SPINNERS.

1882 **Wanted Position as Overseer** of Spinning, warping, slashing, warping and slashing. 25 years' experience in North and South. Can get off production close to 95 % of capacity of frames. ¼ of salary may be held subject to forfeit if I do not fill the bill. Good references. Age 40; family.

1068 **Overseer of Frame Spinning,** Twisting, Spooling and Warping desires position and would accept that of second-hand. Has worked in some of the best mills in N. E. (37 years old, an American and single) on Nos. running from 4s to 80s. Is familiar with Whitin, Mason, Biddeford and Lowell machines. Will go to any of the N E. or Middle States. A1 references, and does not expect a fancy price.

1869 **Overseer or Second Hand** of ring spinning, cone winding, twisting, spooling, cop winding, reeling. 27 years of age; American; single. Of good experience on fine and coarse cotton yarns. Competent and reliable and used to handling all the well known makes of machinery. Will go anywhere. Good references.

1859 **Overseer of Ring Spinning,** spooling, warping, and dressing, desires a position. French; 33 years old; married. Has worked on prints and fine goods, on all the well known machines. Is a thoroughly competent man and understands his business. Best of references.

1779 **Boss Mule Spinner.** Now employed in South, but wants to change on account of climate. Has had 15 years' experience as a cotton spinner, working up to overseer from back boy. Is well acquainted with all makes of English mules, also latest Mason mules, and is familiar with the working of all drafts and twists. Married; 30 years old, and temperate.

WOOLEN WEAVERS.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old, as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1878 **Woolen** Overseer of Weave room. American; married. Very large experience in New England mills, on union cassimeres, chinchillas, dress goods, meltons, kerseys, fancy woolen suitings, and government goods, also fine fancy worsted suitings. Knowles & Crompton looms. A 1 references.

1482 **Weaver or Wool Sorter.** Has worked on cassimeres, cheviots, tricots, kerseys and cloakings. Good references.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

1607 **Worsted Weaver or Fixer.** Will accept fixing job at $2.25 a day. Experience covers worsted coatings, cassimeres, dress goods and jacquard work. Familiar with Crompton and English looms.

COTTON WEAVERS.

1806 **Wanted a Situation** as Boss Weaver or Second Hand, on any kind of plain weaving in cotton, wool, or jute mill. Has had 10 years' experience as boss weaver and 15 years experience as second hand and loom fixer. Am a married man, sober, steady, a good manager of help and a hustler for good productions. Can give good references as to ability, sobriety, and character. Will go to any part of U. S., Canada or Mexico.

1738 **Overseer of Weaving,** Drawing in, Warping, Slashing, and all preparations, 14 years experience in colored mill in Manchester, Eng., and two years in this country. Age 37; English; married. Has worked on sateens, drills, dress goods, zephers, turkish towels, and can pick out own pattern for weaving and drawing-in. Understands the different makes of looms. Wants $3.00 per day.

1879 **Overseer of Weaving** or Assistant Supt. 17 years' experience in New England cotton mills, having charge of 1300 looms for 6 years recently. Fine and coarse goods on all well known machinery. Best of references.

1752 **Overseer of Cotton Weaving,** or Supt. in small mill. 30 years of age; American, and married. Have worked on all kinds of plain and fancy cottons and thoroughly understand jacquard work. Will go any where in the U. S. Best of references.

1826 **Wanted by Steady, Industrious** man, a situation as overseer, in Tape mill. Has had considerable experience, but does not know everything, but willing to improve. $2.25 per day. Has been overseer a short time and has perfect control of help. Age 46; English; married. No family. Would go anywhere, and settle.

WOOLEN CARDERS.

1798 **Boss Carder,** or carder and spinner. Age 49; English. Large experience on fine, medium and coarse wool, also wool, cotton and shoddy mixes, cassimeres, flannel, blankets, kerseys melitons, beavers, government goods, etc. Excellent references and first class man in every respect. Was nine years boss carder in England and has held good positions in this country as boss carder and spinner.

1842 **Carder and Spinner in a Small Mill,** or spinner in a large mill. Has worked on wool, cotton, dress goods, cheviots, shoe cloth, hosiery yarn, and wool, cotton and shoddy mixes. Is familiar with Davis & Furber, Johnson & Bassett, Smith & Furbush machinery.

1701 **Boss Carder.** Age 39; English; married. Has had large experience as boss carder in Canadian mills, also held positions in England before coming to this country. Has worked on all kinds of wool, cotton waste, mungo and shoddy mixes, cassimeres, dress goods, knit goods, blankets. Can take position at once. Excellent references.

1827 **Overseer of Woolen Card Room.** Has worked on blankets, robes, friezes, cheviots, kerseys, flannels, knit goods, cassimeres, hair lines and unions. Age 34; American; married. Wants not less than $3.00 per day.

1801 **Overseer of Carding.** Age 37; German; married. Dress goods, knit goods, wool and cotton mixes, blankets and paper makers' felts. Is familiar with all kinds of American machinery. Wants $3.00 per day.

1660 **Overseer of Woolen Carding.** Does not want to go out of N. E. States. Age 48; American; married. Many years' experience as overseer and has excellent references. Has worked on nearly every class of goods manufactured in N. E., and is familiar with nearly all machinery.

COTTON CARDERS.

1736 **Overseer Cotton Card Room and Combing.** Age 39; married. Has been overseer for past nine years. In last position seven years. Started up two large rooms with combers in each. Thoroughly understands all machinery in card room, and has run all grades of cotton. Can furnish references, if required.

1880 **Second Hand in Card Room** or Second Hand of Combers. 25; American; unmarried. 6 years' experience on fine and coarse cotton, including Sea Island, Egyptian, Peeler, etc. Best of references.

1782 **Overseer Cotton Carding.** Age 25; single. Fine carded and combed cotton yarns. Is familiar with all makes of machinery. Wants $3.50 per day.

1759 **Overseer of Carding Room.** Age 26. Has worked on fine and coarse yarn, and understands all makes of machinery in carding. Good manager of help by speaking different languages. At present overseer in a small mill. Excellent reference as to character and ability. Wants from $3.00 to $3.50 per day.

KNITTERS.

1833 **Wanted.** A position as superintendent of woolen mill manufacturing wool, or wool mixed hosiery or underwear. Is a practical man, understands carbonizing and mixing of stock, etc. References furnished.

1819 **Overseer or Second Hand** of Knitting. Am 27, married, and an American. Have worked on silk, worsted, lisle, cotton and fancy mixed yarns. Understand Scott Williams, Snyder & Fisher, or any latch needle machines. Will work for reasonable wages and go anywhere in N. E. and Middle States. Best of references.

1874 **A Responsible Boss Knitter** of 18 or 20 years experience. 36 yrs. of age; American married. Thoroughly understands underwear and hosiery knitting, flat and circular. Excellent references. Will go anywhere.

1775 **Boss Knitter, Second Hand.** Am familiar with following machines: Nye & Tredick, McMichael & Wildman, and Cotton's Patent. Thoroughly understand ribbed underwear, etc.; 32 years of age; American; married. Will go anywhere and start at a moderate wage. Can furnish the best of references.

1824 **Boss Knitter or Fixer** on ribbed underwear. Has worked on fancies, double knees and tops and plain work. Is familiar with Brinton & Denny, McMichael & Wildman, Huse and Pepper machinery. Will work for $2.50 or more, according to position.

1812 **Boss Knitter** on latch needles, or sewing machine fixer. Age 35; American; married. Has had twelve years' experience, and can handle any kind of latch needles. Excellent references as to character and ability.

DYERS.

1626 **Dyer and Finisher,** with experience on plushes, dress goods, mohair and worsted genapped yarns, cotton and woolen yarns, raw stock. At present employed, but will consider position paying $3 a day.

1864 **Boss Dyer.** Age 34; American; married; desires a position. Has had good experience on wool and cotton mix goods. Employed at present but could take new position in about one week. Good references.

1860 **A First-Class Boss Dyer** wants position. 50 years old; German; single. Has managed some large New England dye houses and is familiar with worsteds, woolens, mohairs, knit goods, pieces, yarn, slubbing, loose wool, carpet yarns and cotton yarns. Will go anywhere and can give references that will satisfy anyone as to his ability.

1850 **Head Dyer** on cotton yarn or cloth, or would take a position as chemist, sample dyer in an aniline manufacturing company, or dyestuff salesman. English; 26 years old; married. Strictly temperate, and can furnish references.

1871 **Fast Black Dyer** on cotton hosiery. Knows a new and secret process of dyeing an aniline fast black, with or without the lisle finish. Guaranteed fast and sanitary.

FINISHERS.

1792 **Boss Finisher.** with over 20 years' experience on all kinds of woolen and worsted goods. Learned business in one of the best woolen mills in Scotland and has also had experience in some very good mills in this country. Strictly temperate and steady, and can give good references as to character and ability. Wants position in a good, steady-running mill at once. Age 38 years; married.

1808 **Boss Finisher.** Has worked on worsteds, cassimeres, blankets, overcoatings, cloakings, flannels, dress goods, satinets unions and beavers, and is familiar with most all makes of machinery. Age 39; American; married. Has had a large experience, and can furnish most excellent references from past employers.

1489 **Boss Finisher.** Second hand or Boss Shearer. Well experienced; excellent references. English; age 27; single.

1716 **Finisher.** Age 29; English; married. Has worked as wet finisher shearer, gigger, second-hand and overseer. Prefers a mill making cassimeres, worsteds, dress goods and face finished goods. A high grade of goods. Is familiar with all kinds of American and English finishing machinery, and can keep same in the best of repairs. Prefers Eastern States. Can take position at one week's notice. Best of references.

1870 **Wanted,** position as cotton finisher. American; age 48; married. Thirteen years' experience in finishing interlinings, shirtings, sheetings and cambrics, in one of the oldest and largest bleacheries in the country. Good manager of help. Can furnish reference.

DESIGNERS.

1789 **Designer,** or assistant supt. and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill.

1445 **Designer or Finisher,** or will take position as supt. of a small mill. German; Protestant; age 36; married. Has worked in several New England mills, and refers to them. Graduate of the Werden Textile School, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery.

1838 **Designer,** assistant supt., assistant designer, overseer of weaving, secondhand large weave room, loom fixer, boss spooler, dresser or mender. Age 48; American; single. Worked on worsteds, cassimeres, dress goods, blankets, chinchillas, cloakings, etc. All patterns of Crompton & Knowles looms, Davis & Furber spooling, dressing and weaving machinery, and Worcester warp compressor.

1858 **Supt., Designer, Twister,** or Has had large experience (13 yrs.) in Austrian and Canadian woolen and cotton mills, with foundation of 4 years in an Austrian technical school. Has made ginghams, shirtings, skirtings, tickings, awnings, flannelettes, domets, saxonies cottonades, ducks, drills, linings, etc., and understands English, Crompton and Thomas looms, plain, cam, Dobby-leno or jacquard, also warpers, twisters and spoolers. Will go anywhere. 36 years; German and widower. Can refer to several prominent Canadian mill men.

MISCELLANEOUS.

1803 **Roll Coverer.** I have done the work for a number of the largest cotton and worsted mills in this country, and am well known throughout the trade. Have been in the business 35 years, and can furnish stock and tools. Would be glad to take piece work, if shop is furnished, or would take a place by the day. Can furnish best of references.

1762 **Chemist.** Age 23; American. Wants a position in dye works, print works or bleachery. $15 a week to start on. Excellent references.

1835 **Beamer, Twister,** also understands drawing in and splitting. Age 27; American. Has worked on ginghams, dress goods, shirtings and cotton worsted.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1851 **Machinist in Woolen Mill.** Can repair looms, cards, mules, etc., of every description, also worsted machinery. Understands forging tools and has fair knowledge of electricity. Ten years experience in some of the best mills in New England.

1845 **Fixer** or secondhand. Age 40; American; married. Worked on all kinds of spring needle work, also latch to a good extent. Gauze underwear, rubber lining, cuff knitting and ribbed hosiery.

1865 **Machinist and Fixer.** Has had eight years' experience. 24 years old; English; single. Is thoroughly familiar with Singer, Wheeler & Wilson, Merrow, Union Special, Lamb, Pepper, and Hepworth and Beattie loopers.

1873 **Master Mechanic** in cotton corporation. Has had large experience. Middle aged; strictly temperate. A graduate of a technical school. Learned carpenter's trade and machinist's.

1764 **Engineer and General Repair Man.** Age 45; American; married. Wants $2.50 to $3.00 a day. Over twenty years' experience.

1866 **Overseer of Burling** and Sewing or Cloth Examiner in commission house. Have had 25 years' experience in the cloth room and can handle any class of woolens or worsteds, either dress goods or men's wear. 41 years old; Irish; married. Best of references. Have a son 19 years old who is a percher and brusher.

1881 **Paymaster or Bookkeeper.** Agent or Manager Wood or Iron working plant or small cotton mill. 28 years' experience. Expert accountant. Can take charge of all the office work in large factory or do all myself in small factory. Good references. Will go anywhere in New England or Middle States.

1704 **Boss Dyer.** Age 36; English; single. Is familiar with dyeing cotton yarn and warp both for bleaching, fulling and other purposes. Has dyed for the best firms in England, also for export work.

1810 **Dresser Tender.** Age 23; German, single. Is familiar with Davis & Furber and Cleveland dressers. Will not change for less than 20 cts. per hour.

1765 **Overseer Cloth Room,** white or colored. Age 48; American. 25 years' experience as secondhand.

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CHARLOTTE, N. C.
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We have now a number of excellent points for new Cotton Mills, or for Knitting Mills, where local capital will join with that from the North in new enterprises. If you are interested, write us.

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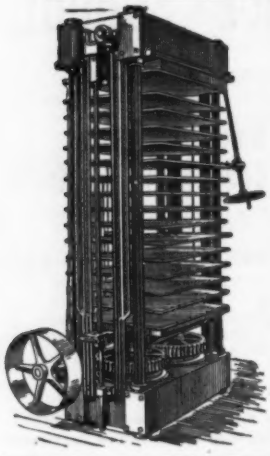

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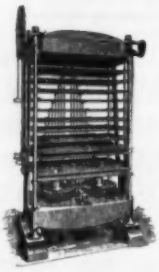

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The most reliable machine of the kind on the market.
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Manufacturers of
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Belt Dressing and Belt Grip.
Tube Cleaners, Raw Hide Belting and Factory Supplies.
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DOMINO FAST BLACK

PERFECT UNIFORMITY OF COLOR

FOR HOSIERY the **DOMINO FAST BLACK** is simply the limit of scientific achievement in the production of a **DYE FORMULA** for **LISLE FINISH.** It insures brilliancy of shade, uniformity in color and cheapness of production—the real requisite for successful competitive manufacture. For **LACE HOSIERY** the **DOMINO FAST BLACK** is comparable in its results. The severest tests have demonstrated it to be, beyond a doubt, **STRICTLY SANITARY**—absolutely **NON-POISONOUS,** fast color and strong in tecture after oxidation, with an unequaled finish.

We are prepared to furnish the **DOMINO FAST BLACK** Formula, or we will install complete Dye Plants for the process, with all or any part of the machinery for **BLACK** or **COLORS,** and under the superintendence of the most practical and successful dyers in the country.

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CALMORE & CO.
501 CHESTNUT ST.
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Absolutely Non-Poisonous

Strictly Sanitary

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

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AN OPPORTUNITY!

CLARK OPENERS.
BRAMWELL FEEDERS.

On account of necessary changes in plans on the part of the purchasers of a number of CLARK OPENERS or PICKERS and of BRAMWELL FEEDERS, the undersigned have at their disposal several of each of the above machines.

They are of somewhat greater capacities and heavier construction than the standard type; a majority of them have never been used and an exceptional opportunity is offered to textile mills requiring FIRST-CLASS openers or feeders.

THE MURRAY COMPANY, Dallas, Texas.

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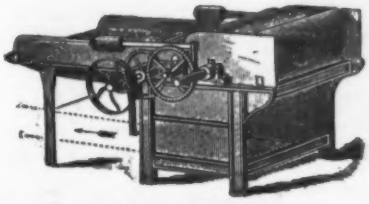
Manufacturers of



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WOOL and WASTE DUSTERS,
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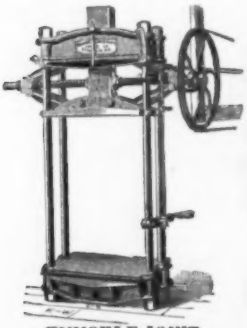
Improved
CLOTH MEASURING MACHINES.

Lumper and Duster Cylinders Refilled and Repaired.



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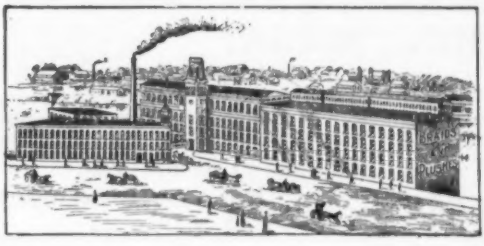
ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS TO SPOOL FROM COP, SKEIN, OR BOBBIN.



FLYER SPUN

Mohair and Worsted

YARNS.

Mohair Plushes,
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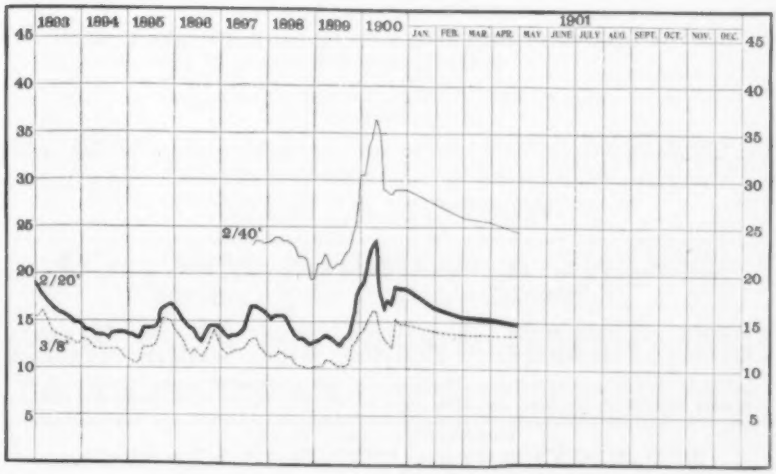
ESTABLISHED 1861.

YARN DEPARTMENT.



Cotton Yarn.

No marked change has taken place in the market for cotton yarns during the month of April. The same conservative policy pursued for months by knitters and weavers has been maintained.

There has been some improvement in the volume of business, but orders have been invariably accompanied by a request for prompt delivery. Judging by the pressing demands for quick deliveries made upon spinners, one would be led to believe that business was booming, but orders are given for small quantities, and the deliveries requested at so early a date that it is an impossibility for the spinner to meet them.

The cheaper grades of yarn are the most depressed. The Southern mills have flooded the country with the lower counts, and the goods have been pressed strenuously upon would-be purchasers. A decline to purchase has been met with a decline in quoted price, and this has been repeated, sometimes again and again, until the buyer does not know what to think of values, is led to believe that the bottom has not been reached, and ends by declining to purchase at any price.

On finer grades the tone is distinctly healthier. No such large stocks as exist in the low grades, depress prices, and purchasers find that early deliveries cannot be secured in many cases simply because the yarn must be made for them.

The curtailment of production on all grades is doing good, and if continued will remove the only menace, that of large stocks. An undertone of confidence prevails in most quarters, and a belief exists that business will be good in the near future.

We quote:—

10s cones	15 to 15½
12s	15½ to 16
14s	16 to 16¼
16s	16½
20s and 22s	17½ to 18½

Warps:—

20/1	13¾ to 14
14/1	14 to 13½
16s	13½ to 14
22s	14 to 14½
14/2	14½
20/2	14½ to 15
30/2	15½ to 16
40/2	24 to 25

Considerable yarn has been sold the past few weeks, at these low prices, and some concessions may have been made on these prices for stock sales.

Philadelphia Yarn Market.

The conditions in the trade are unsatisfactory to spinners. Weavers and knitters are complaining very seriously, also. One bad element of the trade is that many knitters who in-

W. Warren Thread Works,

SPOOL COTTON
on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use
on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns
on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

WESTFIELD, MASS.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

INCORPORATED 1884.

STANDARD THREAD CO.,

Manufacturers of

SPOOL COTTON

For the Manufacturing Trade.

NEW YORK CITY.

BARNESVILLE MFG. CO.

BARNESVILLE, GA.

HOSIERY AND UNDERWEAR YARNS,

Peeler, Bleached, Egyptian or any colors desired. Also,

FINISHERS AND BLEACHERS

of piece goods, underwear, towels, yarns, etc.

THE ONLY USERS OF JACKSON'S FORMULA OXIDIZED BLACK FOR HOSIERY.

We solicit your patronage. Work Guaranteed.

NEW YORK OFFICE and SALESROOM, 910 N. Y. Life Bldg., N. Y.

INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

COTTON WARPS AND YARNS

In gray and all colors, single or in any twist.

NOVELTY YARNS

In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.

We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.

Carded and Colored Cotton for Mixing With Wool

Machined, or in Roving.

sist on getting all their yarn, when prices advance, are trying to get out of orders now, that there has been some decline.

Most of the yarns being offered today are positively below cost. There is hardly any standard price. Quotations which follow are as near the average as we have heard, for small sales. Spinners seem as adverse to taking large orders as customers are to placing them.

Some spinners claim that they will shut down as soon as their present stock of cotton is worked out, and they are only taking orders below cost, to get their cotton out of the way.

We quote:—

Southern frame cones,—

6s and 8s	13½ to 14
10s	14
12s and 14s	14¼ to 14¼
16s	15
20s	15 to 15¼
22s	15½ to 16
24s	16 to 16¼
30s	17½ to 18¼
40s	26 to 27
50s	32 to 33

Woolen Yarn.

Spinners of woolen yarn are fairly well employed, and have secured orders either on commission work or regular orders to last well into September. Some of the orders are for immediate delivery, and some are for deliveries which shall begin in June to July and then run for balance of the year.

These orders were taken from weavers as well as knitters of underwear and hosiery and include fine wool yarn to merino yarn, and then also cheap shoddy yarns. The heavy weight worsted cloth manufacturers have placed but few orders for yarn up to the present time as these manufacturers are using but a small quantity of woolen yarns for backing, most of the work so far calling for solid worsted cloth.

The overcoating manufacturers have been placing orders for shoddy yarn, and some of the stock used would certainly surprise the wearers could they see its composition. The rubber boot yarns are going but slowly and many

New England Cotton Yarn Co.

NEW BEDFORD, MASS.

JAMES E. STANTON, Jr., Agent.

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BOSTON: 77 Bedford Street . . . . . *J. B. JAMIESON, Manager.*
NEW YORK: 346 Broadway . . . . . *P. H. CORR, Manager.*
PHILADELPHIA: 213 Chestnut Street . . . . *P. H. CORR, Manager.*

Mule Spun Hosiery Yarns,
Carded and Combed.

Colored Yarns,
Solid, Mixes and Randoms.

Spinners of Cotton Yarn

Frame Yarns,
Single and Twisted, Carded—Combed—Bleached

Fine Yarns,
For Electrical Purposes

All Numbers 4 to 200.

From
American Peelers, Sea Island, Peruvian and Egyptian Cotton.

BENNETT, HOWLAND, ROTCH, N. B. SPINNING, COHANNET, NEMASKET, GLOBE, SANFORD, } **650,000 Spindles.**

Entire product sold direct to consumers through the Company's own offices.

CAPACITY, 50,000 Spindles.

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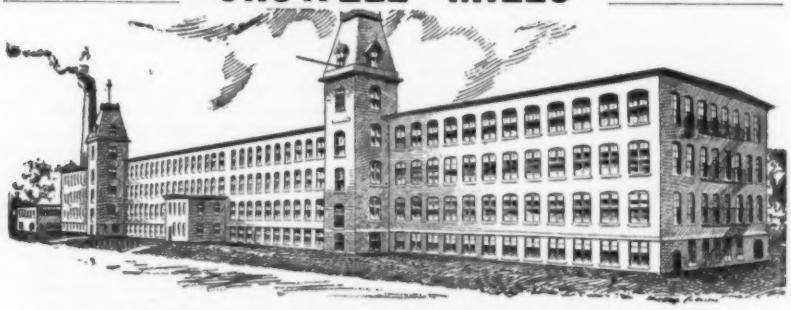
FITCHBURG MASS.



COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

WILLIAM FIRTH, PRESIDENT. FRANK B. COMINS, TREASURER

AMERICAN MOISTENING COMPANY,

150 Devonshire St., Boston, Mass.

The "Drosophore" and "Vortex" Humidifiers.

Over 20,000 of our HUMIDIFIERS in operation.

Highest award on the Recommendation of The FRANKLIN INSTITUTE for

"SIMPLICITY and ORIGINALITY of DESIGN"

DANA WARP MILLS

Westbrook, Maine.

WHITE AND COLORED WARPS,

6s to 50s—Single and Ply.

MULE COPS,

from 30s to 50s from

AMERICAN AND EGYPTIAN COTTON.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

of these knitting mills have but few orders, and some are stopped entirely. The knitter of this class of yarn is crowding the spinner for lower prices, and is placing but few orders even at the lower prices. The open winter is responsible for this state of affairs as the Rubber Boot Mills have been idle most of the time.

The knitting mills throughout the Mohawk Valley have been but poorly employed, and have placed but few orders for material. It is conceded that the fleece lined underwear has had a bad setback and the buyers are getting back to the better makes of flat underwear. Black tops are being extensively used to get the fancy effects so popular with the trade at this time.

The reports from the various markets, except our own, are better, and the present old stock of wool in Europe of less than 60,000 bales now carried forward, and which might have been further reduced, compares favorably with 130,000 bales at the close of last year. Supplies of merino wool must continue moderate for some time in face of the still continued drought in Australia and the disturbed state of South Africa.

On the other hand the volume of business doing is not very large and the progress of recovery from the disasters of last year must be slow. As to the Boston market the position is a peculiar one. The lines of desirable wool are limited and should some enterprising merchant enter the market and purchase the present small supply, it would certainly advance wool materially, especially as the new clip is two months off; and with the West holding out for higher prices, the deadlock is bound to delay the clip at least 30 days longer, making 90 days before much wool will come forward.

Already all the black wool in the grease has been purchased both in Boston and Philadelphia, and same has been withdrawn from consumption so that, if there comes a demand at a later date for black wool, it will be interesting to know where the supply is to come from as more cannot be secured until the new clip begins to move, and it may be July before the supply is replenished.

Importers are selling considerable thread waste, and this is taking the place of Australian lambs' wool. The style of garments are changing so that the thread waste can be most handily worked. The prices for this stock range from 55 to 61 cents.

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

Walcott & Campbell Spinning Co.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., - N. Y.

JAMES E. MITCHELL & CO.,
COMMISSION MERCHANTS.
COTTON YARNS
For All Purposes.
122 & 124 Chestnut St., PHILADELPHIA. 74-76-78 Summer St., BOSTON.
SOLE AGENTS FOR
Lawton Spinning Co., - Providence, R. I.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

COTTON, WORSTED, WOOLEN, MERINO AND FRENCH SPUN YARNS
Mercerized Cotton a Specialty
Write for Samples.
E. A. MORGAN,
54-66 Franklin St., N. Y. City

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Reddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

TRY OUR
SILKINE Also **LISLE SILK FINISH**
For Hosiery, Knit Goods, Yarn, Fast Black and Bleached Goods
O. K. SOAP CO., 968 Franklin St., PHILA.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns — white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS — of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns **only.**

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

...Dyers of Yarn and Slubbing...

BRISTOL, R. I.

FRENCH SYSTEM. BRADFORD SYSTEM

B. F. BOYER CO.,

MANUFACTURERS OF

Worsted and Woolen Yarns

OFFICE AND MILL: Delaware and Cooper Streets. CAMDEN, N. J.

C. MOORE & CO.,

MANUFACTURERS OF

TWINES, THREADS AND YARNS.

Jacquard Harness Twines of all kinds on hand and made to order.

S.W. COR. FIFTH & MARKET STS., Philadelphia.

RICHARD CAMPION,

Selling Agent for—

Bristol Worsted Mills,
Highland Worsted Mills.

17 Bank Street, Philadelphia, Pa.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

Worsted Yarn.

Spinners are securing orders in fairly good amounts from the weavers of men's wear. We hear of some good sized orders having been placed. The demand has been mostly for cheviot yarn, and yarn out of which to make Clay diagonals.

The weavers state that although their initial orders are nearly at an end the duplicate business is beginning to come forward, and the chances now are that they will be enabled to run throughout the season on full time. Cheviots, Clays and undressed worsteds are having the best run, with tendency toward a finer class of cloth which requires yarn in double and twist effects. The demand for yarn during the first half of April was good and many orders were placed, largely by the dress goods manufacturers in 2/36s and other sizes in ⅜ blood quality.

As the month progressed the demand from this source slackened, and there was a temporary abatement in the demand for yarn, caused somewhat by the bad weather. Laterly the men's-wear buyers have taken up the buying, and manufacturers are covering themselves as orders are secured; this demand will increase as the season advances.

The statement as to purchasers must not be taken as meaning there has been a general demand for yarn, for such has not been the case; we mean, however, that some of the mills have been buying yarn in quantities, in some instances at prices which it must be confessed are very low.

It is evident that spinners who sold yarn at high prices last year are not going to allow the buyers to get out of taking the yarn purchased at that time. The delivery of these purchases

J. BROADBENT & SONS,
Woolen Yarns
for Knitting and Weaving, also Wool Spun Cotton Yarns. Equipment first class, practical experience, small expenses, and low prices. Will take work on commission.
UNIONVILLE, CONN.

J. S. DODDS,
517 Wool Exchange, New York, N. Y

MERCERIZED YARNS
Two and Three Ply, for All Purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.
Through H. A. CAESAR & CO.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Mercerized, Turkey Red, Gassed } **Cotton Yarns.**
Jacquard and Harness Twines.

Buckingham, Paulson & Co.,
COMMISSION MERCHANTS,
COTTON YARNS of all Descriptions.
83 Leonard St., New York.
120 Chestnut Street, Phila. 530 5th Ave., Chicago, Ills
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

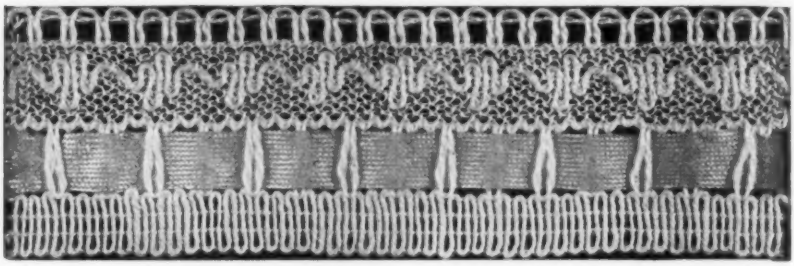
E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.
PAWTUCKET, - R. I.

A. D. SALKELD & BRO.
With
FRED'K VIETOR & ACHELIS.
YARNS,
66-72 LEONARD ST., NEW YORK.

Eddy & Street,
COTTON, WOOLEN, **YARNS AND BRAIDS** WORSTED, SPUN SILK.
PROVIDENCE, R. I.

DAN'L MASON,
Voorhis Mills, PATERSON, N. J.
BUYS JOB LOTS in colored and raw **SILK YARNS.**
Cash Advances on Sales and Prompt Returns.



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... FOR ...

KNIT UNDERWEAR

Our new line of unusually attractive

SAMPLES for SPRING 1902

is now being shown on the road.

With our increased capacity

PROMPT DELIVERIES ARE ASSURED AT LOWEST PRICES.

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NAZARETH, PA.

FLEMING & CHAPIN, 229 Church St., Philadelphia, SELLING AGENTS.

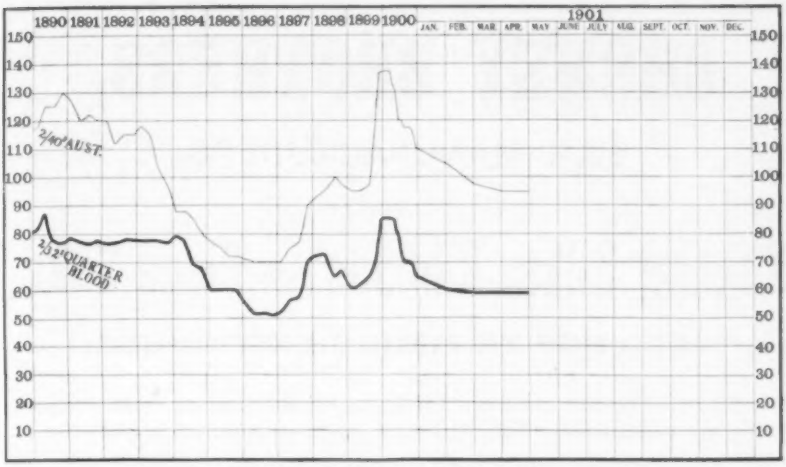

Chart showing Range of Worsted Yarn.

has been put off from time to time in the hope of eventually being able to cancel the orders entirely, and thus escaping a loss on account of the declining market, as much of this yarn can be purchased today 30 cts. per pound less than when bought.

Already one lawsuit has resulted from this state of affairs and the spinner won the suit. It might be said that the weaver in turn should sue his customers, but this would hardly be practical because, while the spinner has only one customer to bring into

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court, the weaver would be obliged to sue several concerns; it looks as though the weavers and knitters must suffer largely through using bad judgment in buying during the boom.

The weavers using worsted yarns have undoubtedly seen the worst of hard times, and from now on a good business will be experienced. Spinners state that prices are very low, but that they are running, although some can see the end of orders at hand, but new orders are being placed to cover duplicates, and the spinners are going to have business enough.

It looks as though the season of 1894 was going to be repeated this coming year. Orders in that year were not secured much before May and June, and after that every mill ran steadily until December. Everything has reached bottom, and there is no danger in placing orders which are certainly needed by the manufacturers and consumers.

Undressed worsteds continue to sell fairly well, and are becoming more popular as the season advances; many of the mills heretofore producing the Cheviot effect are trying to get the soft undressed finish at a reasonable price.

Spinners of French spun worsted yarn are not getting orders as freely as they desire, but a good season is ahead of them, as many of the underwear knitters must place orders soon, as their season is now on and but few orders for yarn have been placed; the hosiery manufacturers have largely over bought, and are not inclined to place orders until orders for hosiery come forward, and those who have not over bought are placing orders very cautiously, barely covering the actual requirements.

Many of the mills which made cotton fleece lined underwear are going back to a garment made from a Merino worsted yarn, in Jaegers and other fancy mixtures. Top manufacturers are getting some orders but the trade is backward.

Prices undoubtedly hold their own on the newly established basis with interested buyers using all kinds of argument to force them lower, but are not generally succeeding. The business is right ahead of us, and is bound to come, as manufacturers on all lines are down to hard pan on prices, and buyers are ready to place orders. We are looking for no boom but a legitimate, steady business.

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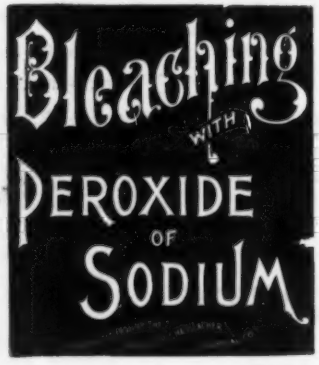

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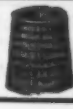

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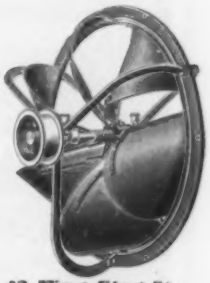

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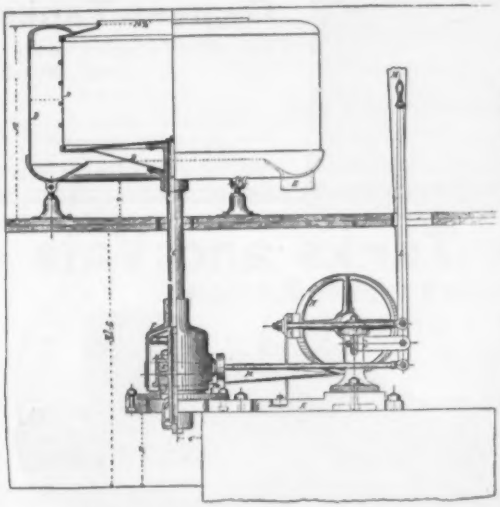

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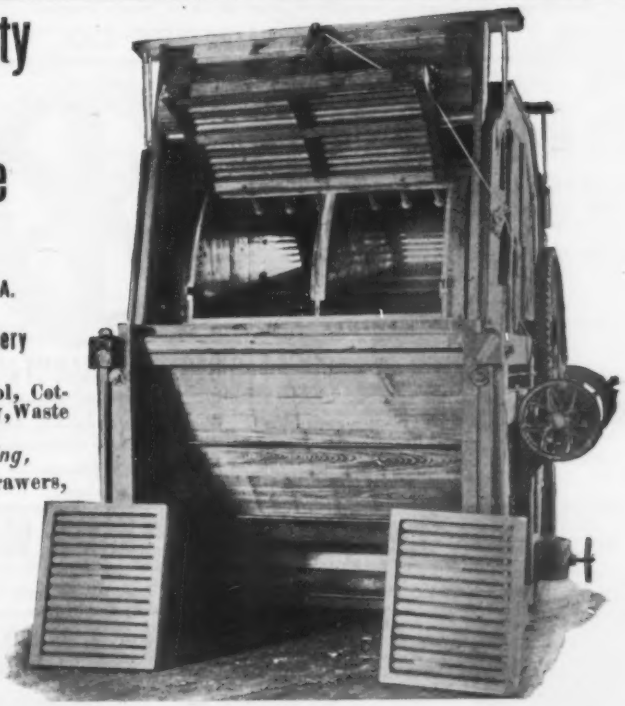

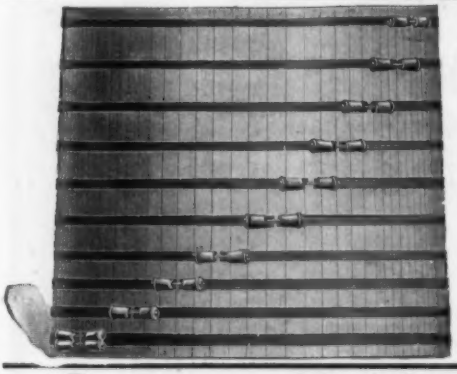

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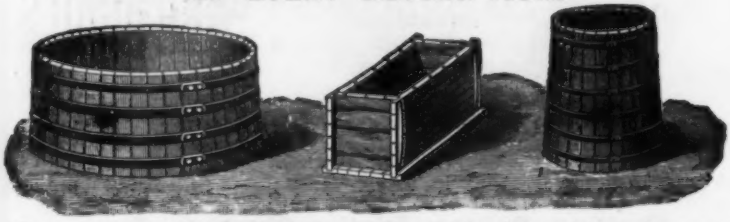

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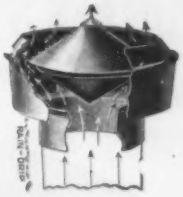

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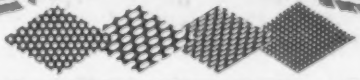

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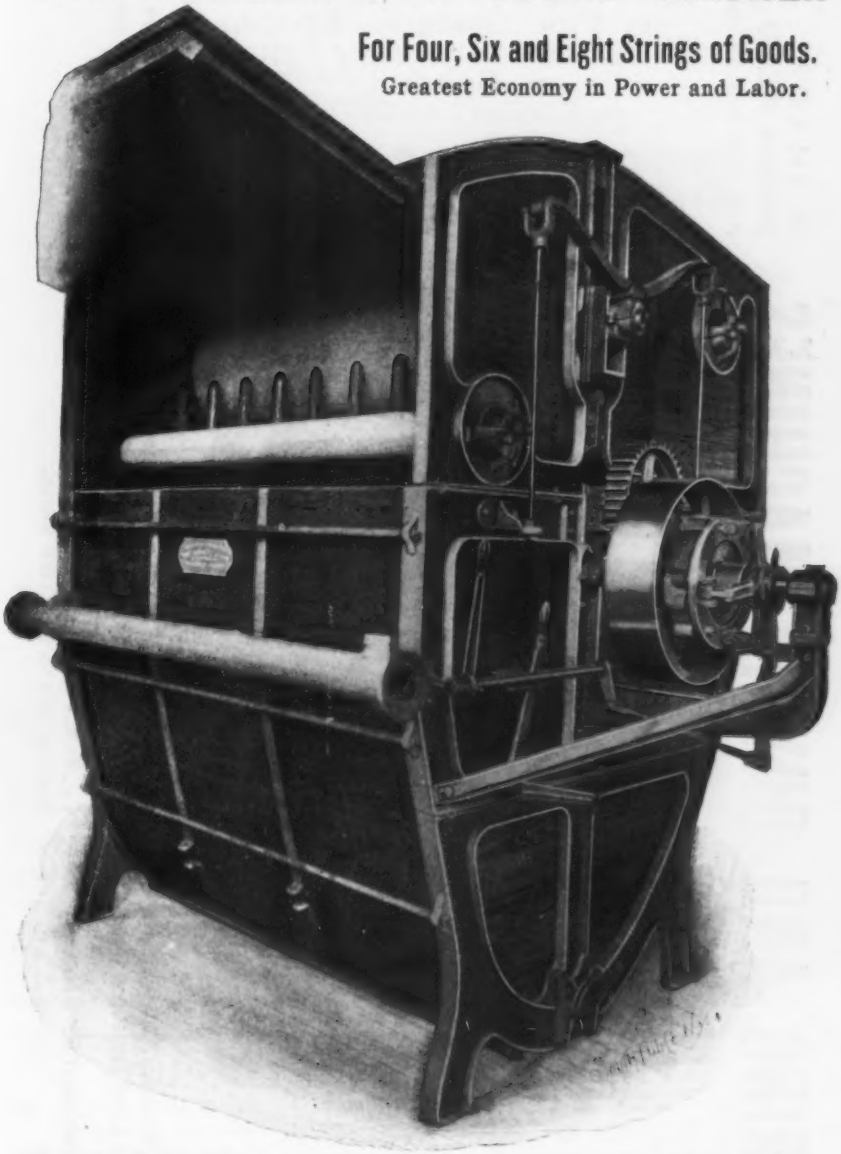

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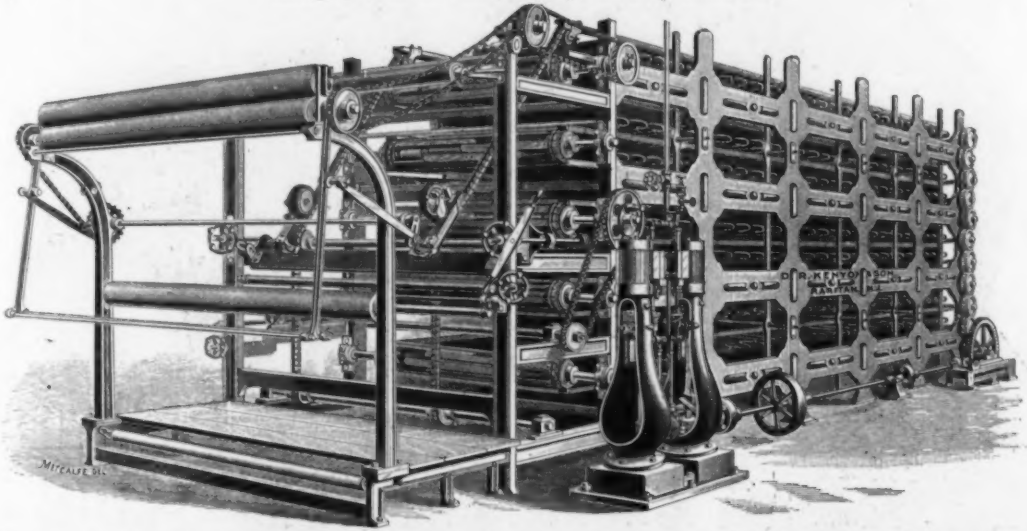

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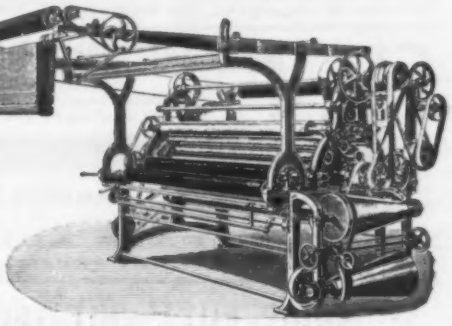

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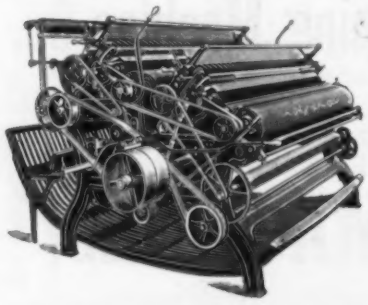

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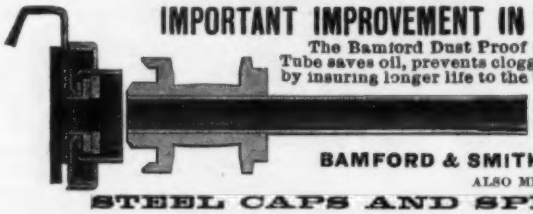

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Our new machine runs with one belt. Has automatic tension device in the leg, heel and toe.
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The Invincible is a compact, light running, full automatic machine, simple in construction, has few parts, runs at high speed, occupies small space, and is put upon the market at a price that defies competition from either full or semi-automatic machines.

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Machines for Rib Hosiery, Rib Tops and Cuffs.

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MECHANICAL STOP MOTIONS

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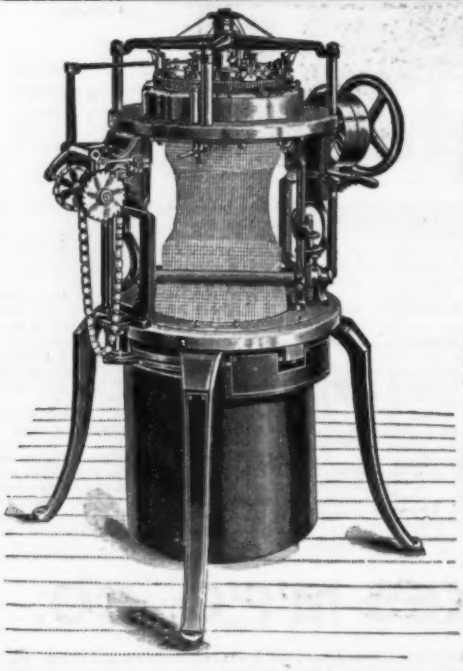

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Displays a Marked Advance

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Entirely New Effects and Radically New Features

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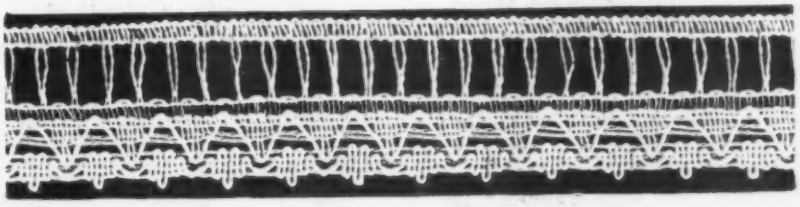

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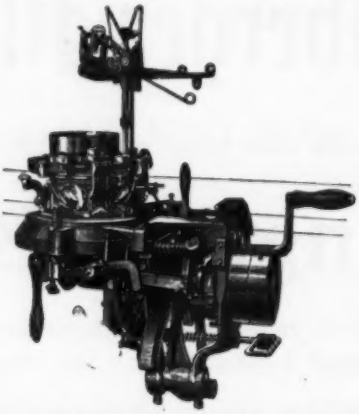

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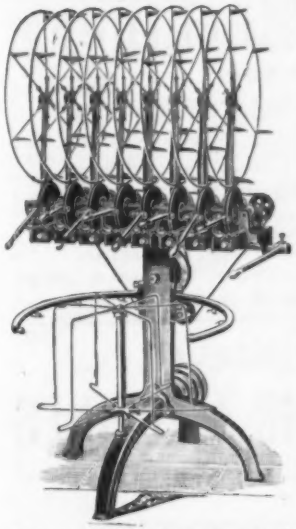

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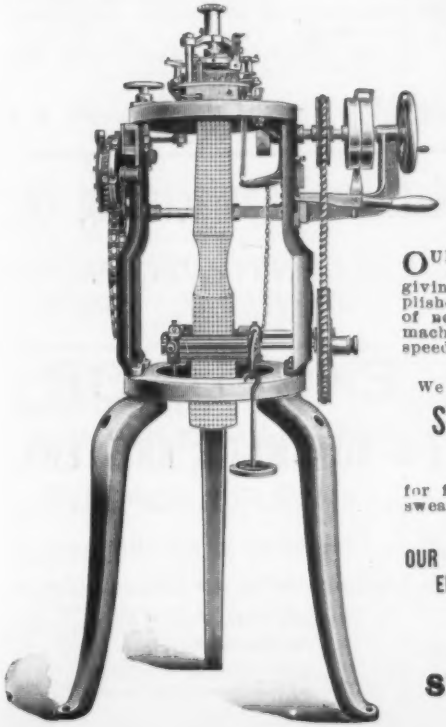

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OUR latest model machinery has been designed to run at **very high speed** giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

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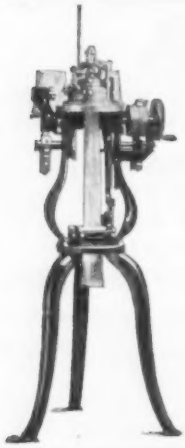

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All kinds of

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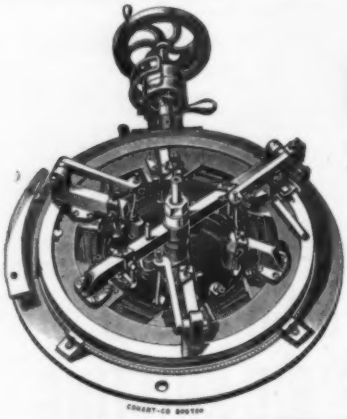

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Either plain or full automatic, with stop motion complete, for

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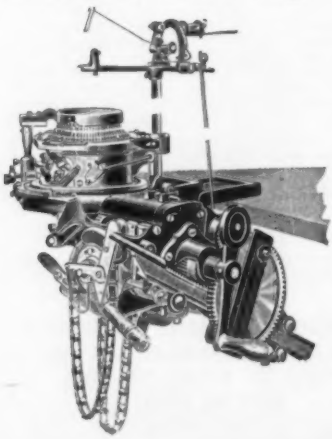

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Its Production is Greater than any 7-8 or full Automatic Machine now on the market.

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Just now we are making a speciality of 14 and 16 feed machines for stripes.

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Automatic Knitter,
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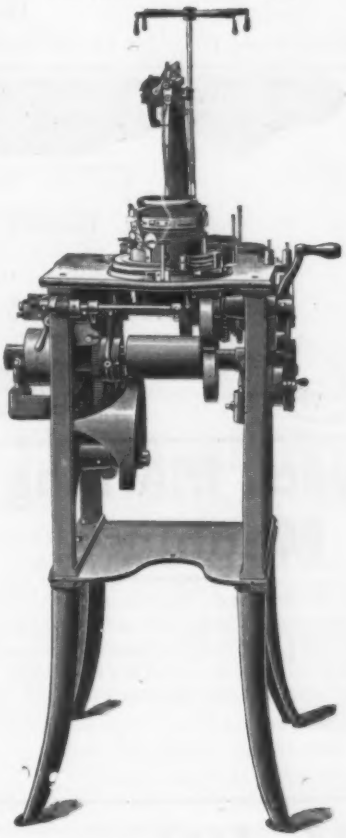

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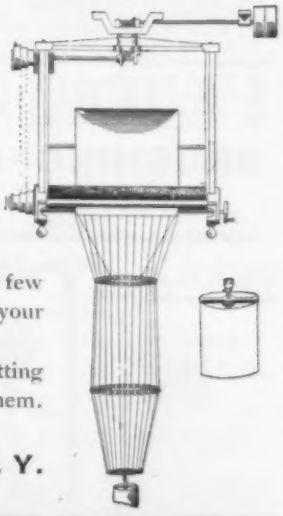

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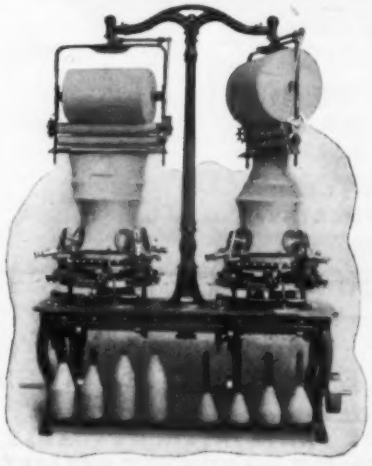

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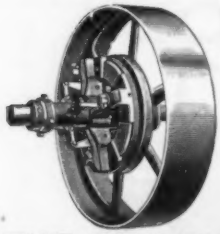

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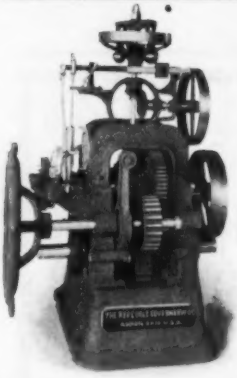

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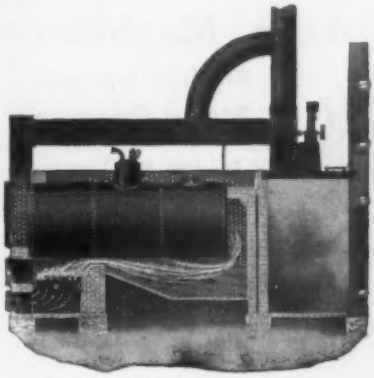

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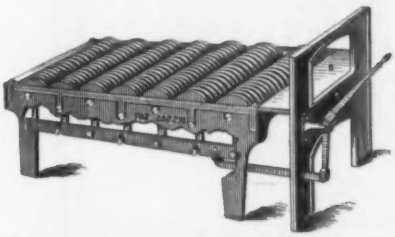

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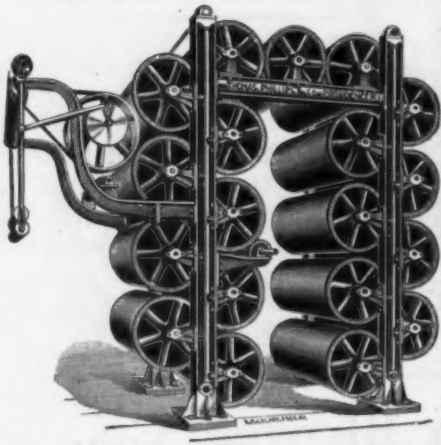

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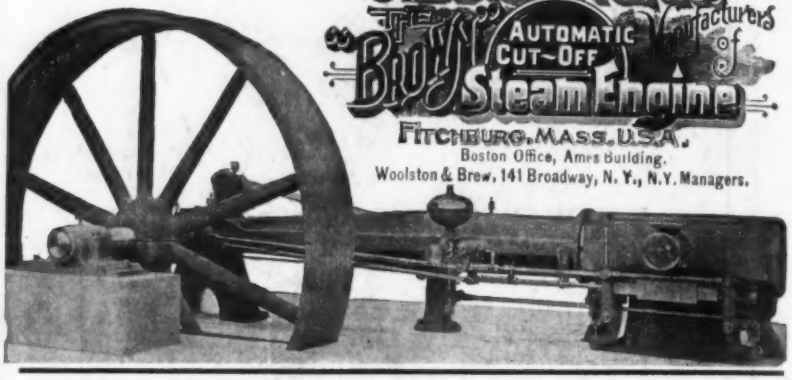

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